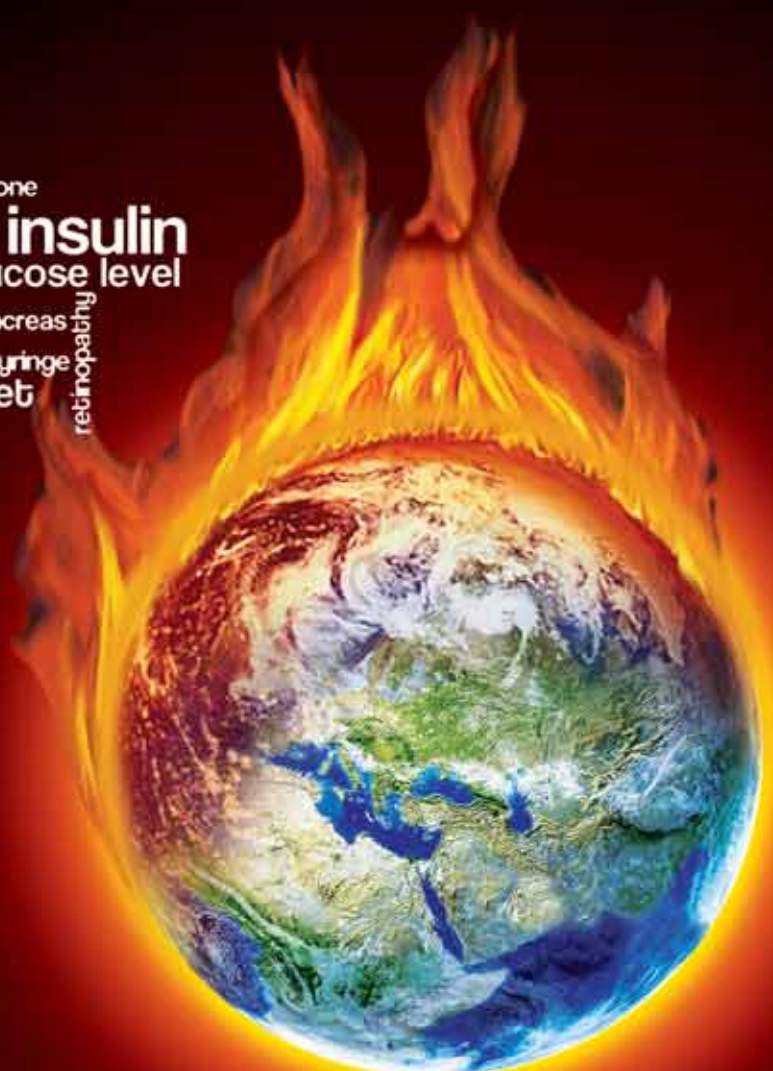
Friendship with Science

Volume - 01 Issue - 02 Aug 2017

Dr. K. V. RAO SCIENTIFIC SOCIETY

NEWSLETTER



Editor's Desk

We are very happy with response for the inaugural issue of our newsletter "Friendship with Science". We wish to extend our sincere thanks to all those who immediately responded to our initiative and sent in their inputs.

In this second issue we are presenting two articles of utmost importance which are having an adverse effect on human lives, Global warming and Metabolic syndrome. We also present two of our Young Research Scientist awardees, Dr. Satish Madala and Dr. Shatabdi Porel, both of whom are actively pursuing a career in research.

Recognition of work leads to better performance in any field. In India there are many awards in science, both at research level and for school students, about which we shall be presenting in our upcoming newsletters. In this issue we present about the most prestigious multidisciplinary science award in India, the Shanti Swarup Bhatnagar Prize for Science and Technology for notable and outstanding research.

We hope you will enjoy the "Fun Corner". Do send in if you have any such inputs. A line up of regular events for school children by KVRSS is also given in the newsletter. Do log in and apply to be part of them.

Post Your Event: We shall be glad to publish about any scientific activity/ happening in any school / institution (it will be put on our website too) Write to us at: **friendship@kvrss.org**

We look forward to scientific articles, puzzles, experiments and other interesting inputs from scientists, teachers, students and all those interested in science who wish to popularise it.

Your feedback and suggestions will be of utmost importance to us in taking forward this initiative in a meaningful manner.

Global Warming

Perhaps no other issue has generated as much public debate (mass hysteria?) as global warming. Every day we are inundated with newspaper and magazine articles on the impending (?) threats of global warming, which has now firmly supplanted other favourite disaster scenarios like 'nuclear holocaust'
This issue has even led to a movie ("The day after tomorrow") and a novel ("State of fear" by Michael Crichton).

Given this background, is there a need for yet another article on global warming? Yes! There is, because many of the media reports on global warming are inaccurate, exaggerated, and filled with bad Physics. So there is a need for an informed discussion on the issue. Of course, the issue has kept busy many scientists and most of them are now convinced, based on the available evidence that global warming is indeed happening and it is due to the increased emission of 'greenhouse gases'.

Let us start from the beginning. The concept of global warming was first postulated by the Swedish Chemist Arrhenius in the 1880s. He said that the average temperature of the Earth would increase due to the increased concentration of 'greenhouse gases' (GHGs) like Carbon dioxide, which absorb the long-wavelength radiation given off by the Earth, while allowing the radiation from the sun to go through. Arrhenius did some rough calculations and came up with a rise of 5°-6° C in the average temperature of the Earth for a doubling of Carbon-dioxide concentrations. He actually felt that this rise would be beneficial! (he was Swedish!). He further added that the ice ages might have been due to reduction in CO_2 levels in the atmosphere.

CO_2 levels have indeed risen from roughly 280 ppm to 400 ppm over the last 200 years. During this time, the average temperature of the Earth has risen by about 1° F. In fact there is an overwhelming wealth of data, which supports the thesis that global warming is for real and it is happening! 15 out of the 16 warmest years in recorded (meteorological) history have occurred since 1995. The increased melting of glaciers is widely documented (see for example: http://www.ias.ac.in/currsci/jan102004/185.pdf).

However, there are some doubting Thomases and Crichtons! Most of these doubters are not from the academic community and are probably being funded by Petroleum and Coal companies, who needless to say have a vested interest in maintaining the status quo. One example of this is "The State of Fear", a novel by the popular author Michael Crichton. Coincidentally (?), this book hit the stands within a year of "Day after tomorrow". "Day after tomorrow" was a spine-chilling portrayal of what global warming can do to our world. Of course, following the age-old Hollywood tradition, it exaggerated the issue (but also had some interesting Physics, which we will discuss later in the article).

"The State of Fear", by contrast, seeks to debunk the theory of global warming. It has been roundly criticised (see for example: http://www.csicop.org/doubtandabout/crichton/) and not without reason. While some of the "scientific" arguments given in the book are interesting, much of it is plain bad Science.

Let us now focus on some of the doubts expressed against the hypothesis of GHG-induced global warming. The climate of our Earth has gone through many prolonged periods of global warming and cooling, apparently without any human involvement. Most of these

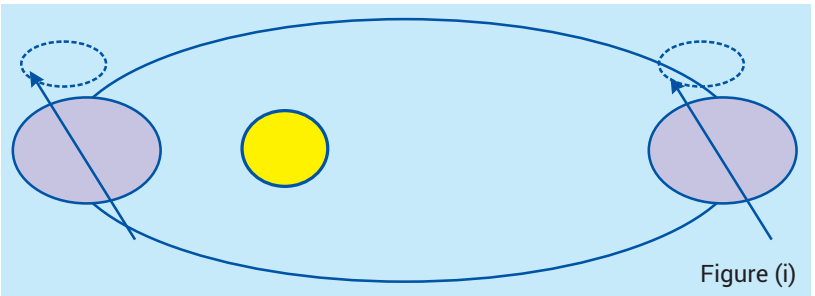


Figure (i)

are periodic changes induced by the nature of the Earth's orbit. The rotational axis of the Earth precesses with a period of about 25,000 years, as shown in figure (i).

This means that summers in the northern hemisphere will occur during December, 12,500 years from now. Couple this with the fact that the Earth is closer to the sun during December and the fact that most of the landmass is in the northern hemisphere and you will conclude that summers will be much warmer than now 12,500 years from now. This will melt more of the ice, which means less light is reflected away which will lead to a runaway warming effect (water reflects less sunlight than ice).

But actually the most profound effects on the climate of the Earth are due to the motion of the continental plates. The time-scale of this motion matches with the prolonged periods of glaciation, which the Earth has gone through. The ice ages probably occur when the continents are near the poles. This will lead to colder winters at the poles and lead to more ice-formation. Once the ice forms there is further cooling due to a feedback mechanism. Ice reflects more sunlight than seawater and hence the global temperature will go down further. The flip side of this feedback effect is that more water vapour in the atmosphere (caused by global warming) will absorb more of the long-wavelength radiation given off by the Earth leading to a further rise in temperature. This feedback can be pictorially represented as shown in figure (ii)

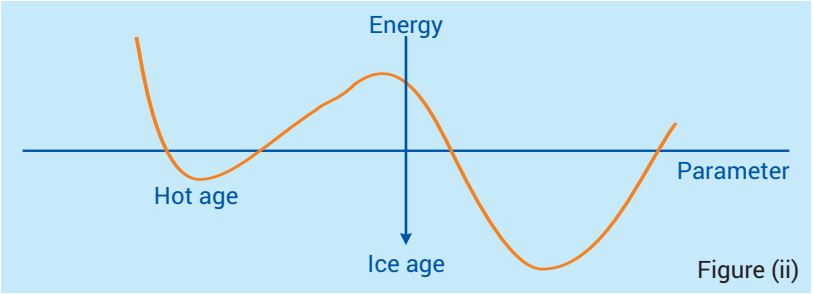


Figure (ii)

The above diagram also suggests how a period of warming can push the Earth, over the barrier and into an ice-age (as dramatised in "Day after Tomorrow").

It is also known that increased average temperature, will increase the probability of extreme weather events: at higher temperature, the system can access more parts of the phase space. That the frequency of extreme weather events is also well documented. The frequency of very heavy rainfall during the Indian Monsoon has apparently increased in the last 50 years (http://www.sciam.com /article.cfm?articleID=3AF9F4CB-E7F2-99DF-3411CFE398433EC2). Still fresh in popular memory is the record number of storms which hit the US in 2005 and the record snow in New York in 2006. Closer home, Mumbai recorded 94 cm of rain on a single day in 2005. Some Indian cities have recorded exceptionally high temperatures. Chennai has recorded temperatures in excess of 45° C, twice in the past 10 years, while the only recorded occasion before that was in 1910. Vijayawada recorded 49° C in 2002 and North India had its coldest winter in 70 years in 2005-06. All these point to a increasingly chaotic and violent future for our globe.

While all these seem to support the hypothesis of global warming, sometimes the debate can be confusing. Will a warm world lead to less or more rain? Simple Physics seems to suggest less rain (a system at higher temperature can hold more water vapour!). Also will the melting of the polar ice-caps lead to rise in the level of the oceans? Yes and no. Yes for the melting of ice on land (which will then drain into the oceans) and no for the melting of the arctic ice-cap (which is floating on water).

While the debate on a warming Earth is almost settled, murkier is the question of its cause. The warming could be part of a natural cycle, rather than due to "greenhouse" gases. How do we settle this? Should we cut down on emission of GHGs, when the debate is still open? According to the author of this article, this is an unnecessary debate. Automobile emissions are in any case harmful to our health, hence they should be kept in check!

So what can be done to stop global warming? Instead of waiting for the governments (especially those in U.S, China and India) to act, as individuals, each one of us should make conscious efforts to reduce usage of our cars (maybe have only one car and use it sparingly: cycle to your office or college). Increased use of public transport is one of the widely circulated ideas. In addition we can look at some far-fetched ones:

1. Ban/reduce all sports events with artificial lighting. (If it is too hot during the day, don't play!).
2. Reduce number of formula-I car/ motorcycle races.
3. Encourage train travel at the cost of air/road travel, which are more polluting

Whatever we choose to do, we better do it fast, time is ticking away.....

Prof. P K Thiruvikraman

Head, Department of Physics
Birla Institute of Technology & Science, Pilani Hyderabad Campus

Metabolic Syndrome and Nutritional Intervention

Metabolic syndrome (MS) is a debilitating health problem across the globe with cluster of interrelated metabolic derangements including disturbances in blood glucose levels and insulin metabolism, abnormal lipid profile, abdominal obesity and high blood pressure. The table-1 provides the information about features of MS. All these metabolic abnormalities could increase the individual's risk for several chronic diseases including type II diabetes, stroke, cardiovascular and kidney disease. MS constitutes a major health problem to the Western world and is estimated to affect at least 20% of the adult population and ~ 40% of adults of age over 60 years. The impact of MS and its risk factors reached catastrophic proportions, especially in developing countries such as India and China.

Unhealthy food habits, adopting western lifestyle and decreased physical activity are some of critical factors which contribute to the development of MS. Numerous studies revealed that intake of low glycemic index foods, manipulation of fatty acids intake, Mediterranean dietary pattern, supplementation with phytochemicals and aerobic exercise could reduce incidence of MS. It is recommended by American Heart Association to have “lifestyle” intervention including diet and exercise modifications as a strategy for overcoming MS. Dietary Plan for management of MS suggests having 45% of total calories from carbohydrates, 15% from protein, 30-35% from unsaturated fats and 5-10% calories from saturated fats. Other key dietary recommendations are to include fiber of 20-35g/day and restrict sodium to 3g/day. In addition to the dietary management, weight loss has beneficial effects on several components of MS such as decreasing the risk for developing insulin resistance and a reduction in body fat leads to improved blood pressure. It is not mandatory to work out vigorously to gain a substantial benefit. Studies have shown that, choosing to do 30-45 minutes of daily moderate exercise (like walking, cycling, swimming) will help reduce the risk of MS.

Low glycemic foods: Another dietary strategy to combat MS is to reduce the intake of foods that require more insulin for their digestive breakdown into energy. Scientific evidences show improvements in insulin sensitivity, improved blood fat profiles (triglycerides) and elevated High-density lipoproteins (HDL) as well as weight loss with the intake of low glycemic load foods where fiber is a natural component of these foods offering low glycemic load. Cereals such as whole wheat, oats, barley, rye, millets like sorghum, ragi, bajra, little millets, all kinds of beans, lentils, chickpeas, mushrooms, peas, apple with skin, pears, peaches, apricots and citrus fruits with high fiber and carbohydrates that break down more slowly, releasing glucose gradually into the bloodstream, tend to have a low glycemic index.

The right Fatty acids: Studies suggest that consumption of MUFA (Mono Unsaturated Fatty Acid) rich diets promotes healthy blood lipid profiles, improves hypertension, promotes insulin sensitivity and regulates glucose levels. Olive oil besides having high MUFA content contains other components like phenolic compounds possessing antioxidant and anti-inflammatory properties. The beneficial properties associated with Olive oil have been ascribed to its high oleic acid content. On other hand mounting clinical experiments have shown that supplementation with ω-3 PUFAs (Omega 3 Poly Unsaturated Fatty Acid) modify many adverse serum and tissue lipid profile related to the MS. Benefits of ω-3 PUFAs consist of a reduction in inflammatory status, decreased platelet activation, mild reduction in blood pressure, improved endothelial function, and increased cellular antioxidant defense. Dietary sources for PUFA include cold-water oily fish, such as salmon, herring, mackerel, and sardines. Among vegetarian food sources, flax seed, canola, chia seeds, walnuts, avocado and dark greens are good sources of PUFA.

Restriction of Salt: Large population-based study identified a positive and significant association between the MS and salt-sensitivity of blood pressure. The study suggests that a reduced intake of dietary sodium is especially effective in lowering BP among patients with multiple metabolic risk factors. Salt-sensitivity has also been associated with increased risk of cardiovascular diseases and premature death. It is recognized that dietary salt have been implicated as targets for manipulation to limit the progression of kidney disease associated with MS. It is advised to pay a careful attention towards salt consumption.

Restriction of high fructose: Accumulated research based evidences and epidemiologic

studies revealed an association between high fructose intake and gain in body weight, insulin resistance, increased accumulation of plasma triglycerides and the development of MS. One unique aspect of fructose is that it is the only sugar that raises uric acid concentration, and this is shown in both humans and rodents. It is also interesting to note that the sweetened beverages are generally consumed with other high energy diets. Hence, the need to pay attention on consumption of commercial food products with added fructose like chocolates, cookies, cakes, white bread, soft beverages and artificial sweeteners.

Summary: High consumption of refined starches, sugar, saturated and trans-fatty acids, foods poor in natural antioxidants and fiber, processed and refined foods; bakery and confectionary foods need to be avoided to combat MS. The choice of healthy sources of carbohydrates, fat and proteins, associated with regular physical activity improves overall nutritional and physical status of the body and decrease the incidence of MS. Exercising seven days a week and taking healthy food is more effective in treating MS than any individual pharmaceutical regimen.

"Treat your food as medicine otherwise medicine will become your food"

-Anonymous

Table - 1

Measure	Cut Points
Waist/Hip Ratio	< 0.90 (Men); <0.8 (Women)
Fasting Blood Glucose	≥ 100 mg/dL
Triglycerides	≥ 150 mg/dL
High Density Lipoproteins	< 40 mg/dL in males; < 50 mg/dL in females
Blood Pressure	≥ 130/85 mmHg

Key Features of Metabolic Syndrome	
MS is a combination of risk factors:	**MS increase risk of for:**
Abdominal Obesity	Type II Diabetes
Insulin resistance and/or high blood sugar	Cardiovascular disease
Elevated triglycerides/ low HDL/high LDL cholesterol	Stroke
Hypertension	Fatty liver disease

Source: Adapted from myweightlossfun.com

Asst. Prof. Anil Kumar Pasupulati

Department of Biochemistry,
University of Hyderbad

Shanti Swarup Bhatnagar Award

This award was instituted in honour Dr Shanti Swarup Bhatnagar, Founder Director and first Director General of Council of Scientific & Industrial Research (CSIR). He is revered as the "father of research laboratories" and is credited with establishing twelve national laboratories in as many years.

Dr Shanti Swarup Bhatnagar

Bhatnagar was born in Bhera , erstwhile Punjab, on 21st February 1894. He obtained his BSc in Physics (1916) and MSc in Chemistry (1919) from Forman Christian College, Punjab. He earned his DSc in 1921 from University College London and went on to join the newly established Banaras Hindu University (BHU) as a professor of chemistry

To honour his name and achievements, CSIR instituted an award Shanti Swarup Bhatnagar Prize for Science and Technology, since 1958 for outstanding scientists who made significant contributions in various branches of science.

He later joined Punjab University, Lahore, as Director of University Chemical Laboratories where he did most of his original scientific work. His research interests included emulsions, colloids, and industrial chemistry, but his fundamental contributions were in the field of magneto-chemistry. In 1928 he and Dr. K.N. Mathur jointly invented the Bhatnagar-Mathur Magnetic Interference Balance, called Bh-M-I-B, which was one of the most sensitive instruments for measuring magnetic properties. It was exhibited at the Royal Society Soiree in 1931 and it was marketed by M/s Adam Hilger and Co, London.

Dr. Bhatnagar played a significant role in building of post independent S & T infrastructure and in the formulation of India's S & T policies. Dr Bhatnagar held a number of important position in the Government. He was the first Chairman of the University Grants Commission (UGC), Secretary, Ministry of Education and Educational Adviser of Government, the first Secretary to Ministry of Natural Resource & Scientific Research and Secretary of Atomic Energy Commission. He was instrumental in the establishment of the National Research Development Corporation (NRDC) of India. In 1936, Dr Bhatnagar was conferred with Order of British Empire (OBE) in recognition of his research contributions. He was Knighted in 1941and elected Fellow of Royal Society, London in 1943. He was awarded the Padma Vibhushan in 1954 by the President of India.

Dr Bhatnagar provided innovation solution to several industrial problems. His major innovation was improving the procedure for drilling crude oil. The Attock Oil Company at Rawalpindi (representative of Messers Steel Brothers & Co London) had confronted a peculiar problem, wherein the mud used for drilling operation got hardened upon contact with the saline water, thereby clogging the drill holes. Bhatnagar realised that this problem could be solved by colloidal chemistry. He added an Indian gum, which had the remarkable property of lowering the viscosity of the mud suspension and of increasing at the same time its stability against the flocculating action of electrolytes. M/s Steel Brothers was so pleased that they offered Bhatnagar a sum of Rs. 1,50,000/- for research work on any subject related to petroleum. The company placed the fund through the university and it was used to establish the Department of Petroleum Research under the guidance of Bhatnagar. Investigations carried out under this collaborative scheme included deodourisation of waxes, increasing flame height of kerosene and utilisation of waste products in vegetable oil and mineral oil industries. Acknowledging the commercial success of the research, the company increased the fund, and extended the period from five years to ten years.

Bhatnagar persistently refused personal monetary benefit from his research fundings, and instead advocated for strengthening research facilities at the university. Bhatnagar wrote jointly with K.N. Mathur Physical Principles and Applications of Magnetochemistry which is considered as a standard work on the subject.

Besides being an eminent scientist, Professor Bhatnagar was a Hindi poet of repute and during his stay in BHU, he composed the 'Kulgeet' (University Anthem) of the University.

Dr Bhatnagar died of heart attack an 1 January 1955. The prestigious award “Shanti Swarup Bhatnagar (SSB) Prize for Science & Technology” was instituted in his honour.

Shanti Swarup Bhatnagar (SSB) Prize for Science and Technology

The Prize is given each year to recognise outstanding Indian contributions to science and technology. SSB Prizes, each of the value of Rs 5,00,000 (Rupees five lakh only), are awarded annually for notable and outstanding research, applied or fundamental, in the disciplines of: (i) Biological Sciences, (ii) Chemical Sciences, (iii) Earth, Atmosphere, Ocean and Planetary Sciences, (iv) Engineering Sciences, (v) Mathematical Sciences, (vi) Medical Sciences and (vii) Physical Sciences.

Any citizen of India engaged in research in any field of science and technology up to the age of 45 years as reckoned on 31st December of the year preceding the year of the Prize, Overseas Citizen of India (OCI) and Persons of Indian Origin (PIO) working in India are also eligible.

The Prize is bestowed on a person who, in the opinion of CSIR, has made conspicuously important and outstanding contributions to human knowledge and progress – fundamental and applied – in the particular field of endeavour, which is his/her specialization.

The Prize is awarded on the basis of contributions made through work done primarily in India during the five years preceding the year of the Prize. In awarding the Prize, the Governing Body of CSIR is guided by the recommendations of the Advisory Committees constituted with the approval of the Chairman of the Governing body of CSIR.

Names of candidates may be proposed by a member of the Governing Body of CSIR; Presidents of academies of all-India character; Vice Chancellors of Indian Universities; deemed Universities and Institutions of national importance; Deans of Science, Engineering, Medical, Agriculture, and Technology Faculties; Directors of the Indian Institutes of Technology (IIT); Directors General of the major R&D Organizations, Directors of CSIR Laboratories/ Institutes, Bhabha Atomic Research Centre, Tata Institute of Fundamental Research, Physical Research Laboratory, Indian Association for the Cultivation of Science, etc.; Secretaries of the Government Science Departments, Member in-charge (Science) in the Planning Commission; and the former Bhatnagar Prize Awardees.

The names of the recipients are made public on 26 September, the CSIR Foundation Day by the Director General, CSIR.

KVRSS Logo

KVRSS has been serving the student community for the past 17 years in Science. The scope and quality of the contribution has been our top priority. Our organisation is a totally non-profit one with the only one interest, promoting science.

The logo of the Society depicts a **Light House** with the words **"Tamasoma Jyothirgamaya"** indicating that the Society is dedicated to spreading light of Science in all directions and to all and that it would unearth and bring to light the scientific talent among the students' pool. It would be involved in shedding light on the scientific achievements of the nation and participate in the popularization of science.

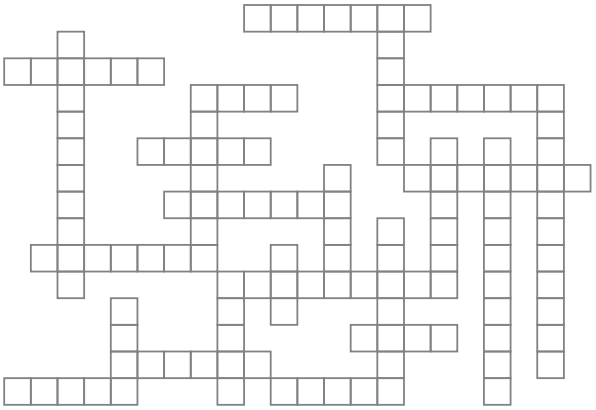
Be it a quiz, a research presentation, an experiment or a fundamental principle in science, it is our endeavor to bring students to our platform. The Society has been providing various opportunities for them to make "Friendship with Science" and have fun and at the same time acquire, achieve and contribute something in science. Since the building in which the Society is housed is called **"Friendship Heights"**, it is appropriate that the activities conducted by the Society inspire students in this direction.

Fun Corner

This section is to involve school students and excite them about science through puzzles, experiments and quizzes. Please send your name, class and name of the school along with your answers. The Solution for the Puzzles will be given in the next Issue.

Fill-in Puzzle

Fill in the Puzzle using the words given. Good luck and have fun



3 Letters
Sun

4 Letters
Mars
Moon
Star

5 Letters
Earth
Venus
Comet
Lunar
Orbit

6 Letters
Saturn
Meteor
Rocket
Launch

7 Letters
Jupiter
Mercury
Neptune
Shuttle
Gravity
Booster
Capsule

9 Letters
Countdown

10 Letters
Astronauts
Atmosphere

11 Letters
Exploration

Word Search

Identify the ten Scientists

H	Z	E	C	E	S	K	L	O	S	V	E	O	Z	B
U	S	K	Y	A	R	W	M	J	H	O	Q	U	C	T
G	Y	O	G	T	D	S	L	D	A	L	T	O	N	B
G	B	O	Z	I	N	U	H	W	X	T	P	R	A	L
A	C	H	N	E	C	V	R	A	M	A	N	I	N	O
L	T	T	F	J	D	E	T	F	R	P	A	A	N	U
I	H	R	Q	X	B	I	G	I	N	C	R	A	Z	I
L	G	E	G	A	D	L	S	B	C	N	I	V	X	S
E	M	B	Y	K	U	T	D	O	P	Q	A	K	T	B
O	P	O	I	S	O	J	G	S	N	M	T	D	B	R
G	X	R	U	T	H	E	R	F	O	R	D	I	M	A
D	B	V	L	M	H	I	N	S	W	E	I	C	C	I
X	C	E	F	R	X	A	G	J	V	B	F	S	O	L
J	O	N	A	S	S	A	L	K	A	T	Y	U	D	L
D	W	S	C	T	F	S	H	Y	B	E	E	V	Q	E

Solution to Word Search & Crossword of May 2017 Issue

Crossword

Across

2. Cellular complex of folded membranes involved in secretion and intercellular transport, after Italian scientist (Golgi Apparatus)
7. Common name of a form of Gypsum used in both orthopaedics and art (Plaster of Paris)
9. Element whose atomic number matches the number of letters in its name (Boron)
10. A Greek mathematician who is famous for theorem about a square drawn on the hypotenuse of a right triangle (Pythagoras)

Down

1. The privately funded Bangalore based company designing a spacecraft for a soft landing on the Moon (Team Indus)
3. Indian satellite named after a 5th century mathematician (Aryabhata)
4. A Nobel-prize winning form of Carbon – a layer that is only 1-atom thick–possessing extraordinary strength and conductance (Graphene)
5. Bursts of particles and ionised gas shooting out from the Sun, which can cause power blackouts on earth (Solar Flares)
6. Element whose atomic number matches the number of letters in its name (Carbon)
8. Last name of the person to whom the goddess of Namagiri, Tamil Nadu, revealed equations and solutions in dreams (Ramanujan)

Word Search

1. Newton
2. Marie Curie
3. Tesla
4. Graham Bell
5. Archimedes
6. Gregor Mendel
7. Hubble
8. Heinrich Hertz
9. Schrodinger
10. Guttenberg

S	D	E	D	C	V	G	N	M	N	G	L	L	A	F
C	N	E	W	T	O	N	E	H	S	L	O	P	D	E
H	O	N	I	C	E	O	D	U	E	W	G	L	G	D
R	U	P	E	S	S	N	I	B	D	R	Q	A	K	H
O	F	S	E	A	R	T	M	B	E	T	T	Z	L	R
D	A	S	R	W	I	A	O	L	M	B	C	Z	Q	G
I	N	C	M	R	H	T	L	E	I	D	D	K	E	R
N	V	T	B	A	S	N	K	A	H	F	B	E	R	E
G	A	V	R	D	U	L	R	P	C	N	E	O	N	B
E	E	G	U	O	J	E	W	O	R	D	P	E	H	N
R	W	R	Y	I	U	A	B	H	A	A	M	D	D	E
J	M	A	R	I	E	C	U	R	R	I	E	S	D	T
L	H	G	I	U	T	S	Q	W	C	A	L	S	E	T
F	K	P	O	Y	D	F	A	Z	V	R	B	N	M	U
D	G	H	L	E	D	N	E	M	R	O	G	E	R	G

Upcoming Events of KVRSS

1) 12th Annual Science Quiz schedule

Preliminary rounds at the five cities, viz.,

1) Visakhapatnam	14/10/2017	3) Warangal	28/10/2017	5) Hyderabad	11/11/2017
2) Vij ayawada	21/10/2017	4) Tirupati	04/11/2017	6) Finals (Hyderabad)	18/11/2017

For details of the districts in each zone,eligibility criteria and format of the application visit our website **www.kvrss.org**

This year we have introduced on-line application for the event which is available on our website.

2) 7th SPARK Innovation Awards

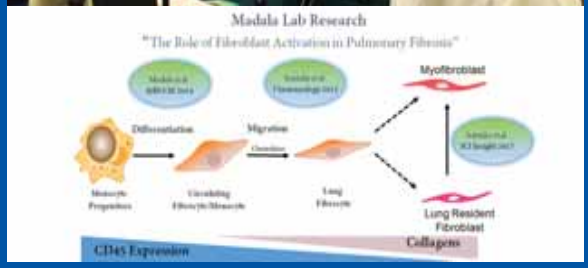
Last Date of Registration:	15th December 2017
Submission Date of Complete Project:	31st December 2017
Date of Final Presentation:	20th January 2018

For detailed Application logon to www.kvrss.org

KVRSS-ite

Dr. Satish K Madala is the recipient of KVRSS Research award for **Biology** in 2004.

He is Currently working as Assistant Professor, at the Division of Pulmonary Medicine, Department of Pediatrics, Cincinnati Children's Hospital Medical Center, OH, USA.



After Completing his Ph D in 2004 from the Department of Biochemistry, National Institute of Nutrition, Osmania University under the supervision of Dr. G Bhanuprakash Reddy, Dr. Satish joined as Post-doctoral fellow at Department of Biophysics and Molecular Biology, Vanderbilt Medical Center and then at Laboratory of Parasitic Diseases, National Institute of Allergy & Infectious Diseases, NIH, MD, USA .

He Joined Division of Pulmonary Medicine, Department of Pediatrics, Cincinnati Children's Hospital Medical Center, OH, USA, as Research Associate and is currently working as Assistant Professor in the same institute.

He has received many awards in this span of work which include: "FARE Award". National Institute of Health, MD, USA. In 2008, "Young Investigator Award" International Summit on Fibrosis, Cleveland Clinic, OH, USA. In 2010 and 2014 and SIC Rising Star Research Award, RCMB Assembly, ATS, Walter E. Washington Convention Center, Washington, DC, USA in 2017. He is also a reviewer for many national and International journals.

His current Research areas include identifying the cellular and molecular mechanisms involved the initiation, maintenance and progression of pulmonary fibrosis.

Dr. Shatabdi Porel Mukherjee is the recipient of KVRSS Research award for **Chemistry** in 2006.

She is currently working as Scientist at the Physical & Materials Chemistry Division of CSIR-National Chemical Laboratory, Pune.

After completing her PhD in 2007 from the School of Chemistry, University of Hyderabad under the supervision of Prof. T.P. Radhakrishnan, Dr.Shatabdi joined Tata Chemicals Innovation Centre, Pune as Deputy Manager (Scientist) and later worked at Central Salt and Marine Chemicals Research Institute, (CSMCRI) Bhavnagar as Scientist. She joined National Chemical laboratory, (NCL) Pune as Scientist in 2015. During 2012–2013 she was at Trinity College, Dublin, Ireland as IRCSET-EMPOWER Postdoctoral Fellow. She is a recipient of Nehru Postdoctoral fellowship, 2011-2013 Human Resource Development Group, Council of Scientific & Industrial Research, India

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