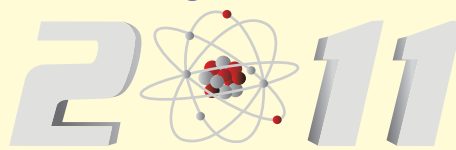




RASATHANTHRA

St. Teresa's College, Ernakulam-11, Kerala

Department of Chemistry



St. Teresa's College, a pioneering institution in the field of Higher Education in India, was established on 15th June in the year 1925, as the first Women's College of the erstwhile Cochin State and the second in the whole of Kerala by the Congregation of the Carmelite Sisters of St. Teresa. The history of the College is replete with recognition and awards earned not only for academic excellence but also for achievements in the field of arts and sports. It has been regularly bagging best college awards for its outstanding merit. The college is affiliated to Mahatma Gandhi University accredited with A grade by the National Assessment and Accreditation Council. The College has been accorded the College with Potential for Excellence recognition by the University Grants Commission.

Department of Chemistry: A glance

The Department of Chemistry of St. Teresa's College was founded in 1963, under the

charismatic leadership of Dr. (Sr.) Bertille. The Department started with Chemistry subsidiary course for Botany, Zoology and Home Science B.Sc. courses. The Department was raised to a UG Department in the year 1966. The faculty consists of 5 members; four are PhD holders. One of the faculty members has submitted her PhD thesis. Two of them have postdoctoral experience in reputed institutes such as University of Minnesota (USA) and Cochin University of Science and Technology. One of the faculty members is a Common Wealth Fellowship winner. She recently registered as a recognized research guide. The Department library has over 300 books. The Department includes two large and well equipped B.Sc. (Main) and B.Sc. (Subsidiary) laboratories and a spacious storeroom for the chemicals, which is always kept well stocked. The Department of Chemistry aims at empowerment through excellence in education.

**MESSAGE
FROM MANAGER**



Chemistry is an essential part of our existence, which is intertwined with almost every aspect of human life. Various forms of matter ranging from the food we consume to sustain our lives; the clothes we wear to shield our body; the places of shelter we build to safeguard ourselves and our kith and kin, to the drugs we take to recover from/prevent illness are all nothing but Chemistry and its applications.

The International Year of Chemistry 2011 commemorates the achievements of Chemistry and its contributions to humankind. It hopes to increase the public appreciation and understanding of Chemistry, increase young people's interest in Science, and generate enthusiasm for the creative future of Chemistry.

Chemistry, which is one of the fundamental Sciences, will play a major role in developing alternative energy sources and in feeding the world's growing population. The Bible says, "If you pour yourself out for the hungry and satisfy the desire of the afflicted, then shall your light rise in the darkness" (Is. 58:10). If our knowledge and applications of Science cannot feed the hungry we have no right to pursue research or study in these disciplines.

I am happy that the Department of Chemistry of St. Teresa's College has given due importance to this celebration by organizing various programmes in appreciation of the subject and its contribution.

Rev. Sr. Francis Ann, CSST

The Dept. of Chemistry of the college is bringing out a newsletter- the first of its kind. It is fitting that this endeavor should be undertaken this year which is being celebrated as the International Year of Chemistry. May I offer my congratulations on this special occasion and my appreciation for the commendable work that you continue to do.

It is my belief that the newsletter will be an exciting platform for the students and teachers to express their views, to share the new and latest developments in the field and a forum for interaction. It will undoubtedly be a means to bring out hidden talents of the members of the Department and the students. It will, I am certain, kindle a deeper and more intense interest in exploring the mysterious world of Chemistry.

I wish to extend my best wishes to you and hope that many such ventures will be taken up in the coming years. God Bless!

Rev. Sr. Christabelle, CSST

**MESSAGE
FROM PRINCIPAL**



**MESSAGE
FROM HOD**



Smt. Geetha Andrews

It is a moment of pride for the Department of Chemistry as we release the first newsletter of our Department. It was the dream and vision of our founder HOD Dr. (Sr.) Bertille CSST, to lead the Department to greater heights. On this happy occasion, I humbly bow my head before the Almighty of the innumerate blessings showered on our Department. I also congratulate Dr. Saritha Chandran A. who worked tirelessly to bring out this newsletter within a short span of time.

Rasathanthra is the first of its kind from the Department of Chemistry since its inception 45 years back. The proposal of release of a newsletter to commemorate the International Year of Chemistry (IYC 2011) came from our HOD, Smt. Geetha Andrews. I see myself proudly playing the part of editor to *Rasathanthra*. We have tried to make it as impeccable as possible. Being the first attempt, errors and omissions are human, but not unpardonable. Suggestions and criticism are welcome since they enhance perfection of any endeavor.

**A WORD FROM
THE EDITOR**



Dr. Saritha Chandran A.

FORMER FACULTY



Dr. (Sr.) Bertille (Late)
Founder HOD
M.Sc., Ph.D. (1963-1991)



Prof. K. A. Annakkutty
M.Sc., M.Phil. (1964-1997)



Prof. Agnes Mathew
M.Sc. (1969-2002)



Prof. Thresiamma Sebastian
M.Sc. (1969-2001)



Prof. Kunjamma Varghese
M.Sc. (1969-2003)



Prof. Nancy Joseph
M.Sc. (1969-2003)



Prof. Aleyamma Leni Oommen
M.Sc. (1970-2003)



Prof. Celine V. A.
M.Sc. (1972-2004)



Prof. Radha L.
M.Sc. (1979-2004)



Prof. Anna K. J.
M.Sc. (1986-1999)

CURRENT FACULTY



Smt. Geetha Andrews, HOD
M.Sc., M.Phil.



Dr. Ushamani M.
M.Sc., B.Ed., Ph.D.



Dr. Jaya T. Varkey
M.Sc., Ph.D.



Dr. Anu Gopinath
M.Sc., Ph.D.



Dr. Saritha Chandran A.
M.Sc., B.Ed., Ph.D.

NON TEACHING STAFF



Sri. Thomas Mathew
(Raju Pallan)



Smt. Mary Magdeline F.
(Maggie)

DEPARTMENT ACTIVITIES 2010-11



Inauguration of International Year of Chemistry Celebrations



Done by Hon'ble Union Minister of Civil Aviation and Overseas Indian Affairs, **Sri. Vayalar Ravi** on March 11, 2011. The newsletter *Rasathanthra* was released during the function. In the Technical sessions, Dr. P. S. Parameswaran, Scientist G, National Institute of Oceanography, Cochin and Dr. E. P. Yasodharan, Professor, Cochin University of

Science and Technology (Former Chief Inspector of Chemical Weapons, UN and Former Vice Chairman and Principal Secretary, STEC, Govt. of Kerala) delivered talks. There was also a film show on *Hundred discoveries in Chemistry* and a Science drama based on catalysis *Mollakkayude Kuthira*.



National Science Day Celebrations and Sr. Bertille Memorial Endowment Lecture

On *Chemistry for today* - supported by Kerala State Council for Science, Technology and Environment and DST, Govt. of India. Keynote Address was by Prof. (Retd.) S. Sivadas, Department of Chemistry, CMS College, Kottayam. There was a Quiz and Poster Competition on the topic *Chemistry in our lives*; March 22, 2011.



- A grand Farewell to IIIrd year B.Sc. students; February 4, 2011.
- An interactive session by Sri. Mammen Abraham on *Personality development* for IIIrd year B.Sc. students; February 1, 2011.
- A class on *Symmetry and Group Theory* by Dr. Lovely Mathew, Associate Professor, Dept. of Chemistry, Newman College, Thodupuzha, Kerala; October 3, 2010.
- An interactive session on *Soft Skill Development* by Dr. P. V. Joseph, Professor, Dept. of Chemistry, Maharaja's College, Ernakulam; June 30, 2010.
- Inauguration of the Chemistry Association by Dr. C. H. Sujatha, Senior Lecturer, Chemical Oceanography Department, Cochin University of Science and Technology. Aswathy R., third rank holder and five students who secured 90 percentage marks in the Mahatma Gandhi University B.Sc. Chemistry Examinations, 2010 was felicitated during the function; June 29, 2010.

OUTREACH PROGRAMMES

TROP

(Teresian Rural Outreach Programme)

Motivational interaction on **Potential development through self awareness** by Sri. Mamman Abraham, Retired Manager, Federal Bank and **Energizing students through YOGA** - a YOGA demonstration class by Mrs. Charu Narayanan (State YOGA Champion) and Kumari Meenakshi Narayanan (National YOGA Champion) for the students of St. Mary's School, Vallarpadam, Ernakulam; October 22, 2010.



A Dental Checkup Camp

By Dr. Susha Miriam Biju
and her team, of Vettikkattil Dental Clinic
Fort Cochin; October 20, 2010.

ACHIEVEMENTS OF FACULTY 2010-11

- ▶ Dr. Anu Gopinath bagged the prestigious **Common Wealth Fellowship** of the Common Wealth Commission, U. K., which is awarded to 30 outstanding researchers from all over India every year.
- ▶ Dr. Anu Gopinath registered as a recognized **Research Guide** at the Mahatma Gandhi University.
- ▶ Smt. Geetha Andrews presented a paper on “*Value education- A powerful tool for human resource development*” at a National Conference on **Enhancement of Human Resources through Excellence in Higher Education**; organized by Christ University, Bangalore; February 16-18, 2011.
- ▶ Dr. Anu Gopinath published two textbooks for the B.Sc. Chemistry Ist and IInd Semester Core course of Mahatma Gandhi University.
- ▶ Dr. Ushamani M. presented a paper on “*Polymers in holography*” at an International Conference **Latests in Polymers** organized by and held at J. J. Murphy Research Center, Rubber Park, Perumbavoor, Kerala; August 12-13, 2010.
- ▶ Dr. Saritha Chandran A. presented a paper on “*Conducting short fiber composites*” at an International Conference **Latests in Polymers** organized by and held at J. J. Murphy Research Center, Rubber Park, Perumbavoor, Kerala; August 12-13, 2010.
- ▶ Dr. Saritha Chandran A. presented a paper on “*NR/PANI coated nylon fiber conducting composites*” at an International Conference **APT'10** organized jointly by the Department of Polymer Science and Rubber Technology, Cochin University of Science and Technology and the J. J. Murphy Research Center, Rubber Park, Perumbavoor held at J. J. Murphy Research Center; February 26-27, 2010.

ONGOING RESEARCH PROJECTS

- A major project funded by DST under WOS-A Scheme titled “*Biogeochemical studies on the coral reef ecosystem of Lakshadweep archipelago*”- Dr. Anu Gopinath
- A minor project funded by UGC titled “*Biogeochemical constituents of seaweeds of Kerala coast*”- Dr. Anu Gopinath

CHEMISTRY ASSOCIATION

The Chemistry Association is a fraternity of the students and staff of Department of Chemistry which aims at inculcating entrepreneurship skills in students. The Chemistry Association is very active and organizes many events for the students throughout the academic year. These are usually interactive and encourage student participation, ensuring the all round development of the students. The events organized by the Association include career guidance, special lectures, seminars, extension activities, training programs and various inter & intra Departmental competitions for students. Membership of the Chemistry Association is open to all students of the Department.



RANK HOLDER
Aswathy R.
Third Rank
B.Sc. Chemistry 2010

FEATHERS ADDED TO THE CAP

Youth Festival

Mrudul Vijay Supekar, I prize, Group Dance
Rajeshwari M. P., II prize, Thiruvathira
Devika E. R., II prize, Thiruvathira
Sruthymol P. P., II prize, Oppana

Scholarships/Awards/Prizes

**Sr. Bertille Endowment Prize
to 3 Outstanding students
of the Department**

**Prof. Annakkutty Prize
for the Best All Rounder
of the Department**

In the loving memory of



ANJU LUZY GEORGE
1st B.Sc. Chemistry

PRIZES INSTITUTED BY THE CHEMISTRY ASSOCIATION

Best Seminar Presentation given to a IIIrd year B.Sc. student

Best Lab performer for a IIIrd year B.Sc. student

Hundred percentage attendance award for B.Sc. Students

Award for Selfless Service to the Department

for a student who earnestly contributes to the Department

Best All rounder of the IIIrd year B.Sc. Class

Miss Chemistry prize

for an outgoing IIIrd year B.Sc. student at the Farewell function

ARTICLES



IYC 2011
International Year of
CHEMISTRY

IYC 2011

Preethi Padmanabhan
II B.Sc. Chemistry

In April 2006, during IUPAC (International Union of Pure and Applied Chemistry) executive committee meeting, the idea for an international event was first discussed. From that meeting, an IUPAC committee was appointed to work along with UNESCO in the creation of the event and finally during 2008, the year 2011 was officially designated the INTERNATIONAL YEAR OF CHEMISTRY (IYC 2011); additionally 2011 marks the 100th anniversary of the Nobel Prize awarded to Madame Marie Curie, so that IYC 2011 will also be devoted to celebrate the contribution of women to science. Also the year 2011 coincides with the 100th anniversary of the founding of the International Association of Chemical Societies. The slogan for the event is "Chemistry-our life, our future".

The Nobel Prize winner in Chemistry, Madame Marie Curie, author of several books and founder of the Radium Institute

in 1911, was a Polish born French Scientist. In 1898, she discovered two new chemical elements Polonium and Radium. In 1903, she was awarded Nobel Prize in Physics, shared with her husband, Pierre Curie and a physicist Henry Becquerel for discovering radioactivity and became the first person to achieve this distinction twice.

The goals of IYC 2011 are to increase the public appreciation of Chemistry in meeting world needs, to encourage interest in Chemistry among young people and to generate enthusiasm for the creative future of Chemistry. Chemistry is the science of matter and the changes it undergoes. Chemistry is vital to our understanding of the world and cosmos, especially molecular transformations are important to the production of food, medicine, fuel and countless manufactured and extracted products.

The activities during the IYC 2011 will emphasize the importance of Chemistry in helping to sustain the natural resource base of life. The IYC will celebrate the art and science of Chemistry and its essential contributions to knowledge, to environmental protection and economic development.

This is a 'once in a life time' opportunity for national and regional chemical societies, educators, industrial associations and others to join together to raise the profile of Chemistry around the world and communicate the central importance of Chemistry in every facet of modern life.

Burning of plastic waste at home-Dangerous health effects



Dr. Ushamani M.

Burning of plastic waste is simply dangerous to your health and the health of the environment. Plastic such as PVC (polyvinylchloride) is common in bottles, jugs, plastic packaging, blister packs, etc. When these are burnt in the house, carbon monoxide, dioxins and furans are released into your air. Whilst carbon monoxide is a pretty well known poison. *Dioxin* is a toxic organic chemical that contains chlorine and is produced when chlorine containing hydrocarbons are heated at high temperatures. To inhale dioxin/furans or to be exposed to its fumes can cause many deadly results. Studies reveal that it causes cancer, impotence, asthma and other allergies to human beings. Testicular cancer has increased by 65 per cent between 1979 and 2001. Some girls are achieving puberty earlier than older generations. It also causes birth defects in the respiratory and cardiovascular systems when inhaled by a pregnant mother.

Plastic bags are a very large part of the toxic portions of our solid waste daily and there is no safe way to dispose them. If you bury them, they will poison the soil for generations. If you burn them, you pollute the air with toxins. If they end up in the waterways and eventually the oceans they cause death of organisms which causes starvation.

More than one million sea birds and approximately 100,000 sea mammals die each year after ingesting or becoming entangled in plastic debris. Because plastic bags are so light weight, they are easily airborne and are found everywhere, littering the countryside with many potential dangers and choking up drains. They can hold pockets of water where mosquitoes breed. They can cause the soil underneath to become infertile. They are non-biodegradable and take hundreds of years to break down in the environment. Many countries are beginning to either ban them or control their use. Plastic should never be burned in the open air.

What can people do?

- *Avoid plastics:* excess packaging and plastic bags should be avoided, do not purchase goods packed in PVC packaging, which generates dioxins when burned.
- *Reduce waste:* buy products in packages or containers, that can be reused or refilled (glass and metal containers)
- *Separate plastics:* separate plastic waste from other waste before they are treated.
- *Recycle:* demand your municipality to organize recycling of plastics, paper, glass and metals.
- *Use Biodegradable plastics/polymers*

Do yourself and the world a favour. STOP BURNING PLASTIC NOW!

That awareness alone helps us protect the Earth, make peace, and take care of life in the present moment and in the future. If we are aware, naturally we will try to use fewer plastic bags.

Conducting plastics

Dr. Saritha Chandran A.

Frowning at the title? Conducting plastic??? Nonsense!

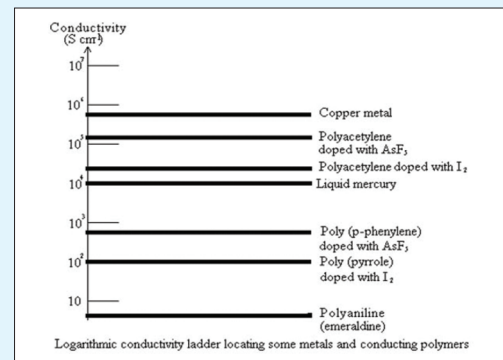
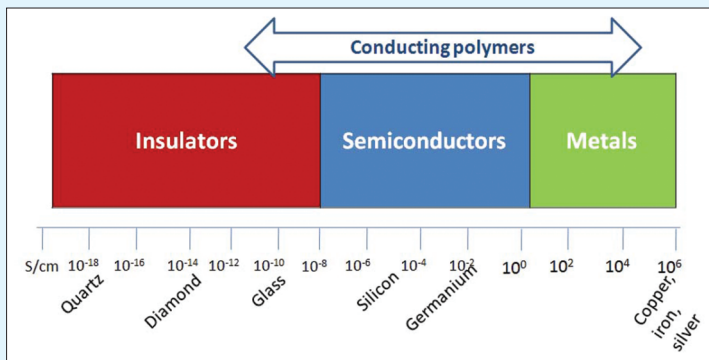
You know that plastics are polymers. Polymers are complex and giant molecules consisting of large number of simple repeating units, made from simple molecules. Their molecular weights can be as high as several hundred thousands. Though polymers can be either organic or inorganic, the term “polymer” is usually referred to an organic polymer. Thus, polymers are essentially *organic macromolecules* i.e., they are simply very large organic molecules. Polyethylene (PE), Polypropylene (PP), Polyvinylchloride (PVC), Teflon (PTFE), Polyethylene terephthalate (PET) etc. are some polymers that form commodity items of our day to day affairs.

Do you think these can conduct electricity? Can a plastic bag (PE) or a plastic bottle (PET) conduct electricity? I know, your answer would be on the negative. How can an organic molecule possibly conduct electricity? It is a metal that conducts electricity. Conducting wires are made of copper and aluminium and they are metals, aren't they? In fact, nobody might have bothered to check the conductivity of these organic macromolecules for the simple reason that organic molecules were taken for granted to be non-conducting materials for ages.

But something happened which overturned our perception of organic molecules for ever. Electrical conductivity was recorded in certain organic solids in 1911 by Mecoy and Moore. Well, nobody even dared to dream of such a phenomenon. Chemists began to look at organic molecules with more respect, I reckon. Researchers all over the world tried to detect conductivity in all kinds of organic molecules that they knew. But, a significant breakthrough occurred only in 1977. A group of three eminent researchers Hideki Shirakawa, Alan J. Heeger and Alan Mac Diarmid discovered that an organic macromolecule, Polyacetylene have metal like conductivity- conductivity as high as metals. This triggered a new life in this research area. For this astonishing discovery, the three were bestowed with Nobel Prize in Chemistry in year 2000.

All this led to the evolution of a new class of materials called *conducting polymers*. Shall we define them? Conducting polymers are organic macromolecules that possess the electronic, electrical and magnetic properties of metals. They behave as though they are metals. But do you think that all polymers can conduct electricity? Certainly not! All conducting polymers are polymers. But all polymers are not conducting polymers. Nice one, eh? Then what makes them different from other polymers? Answer lies in their chemical structure. Conducting polymers usually have a highly conjugated structure. Charge carriers can easily move through this conjugated backbone and hence these molecules can show high conductivity. Polyacetylene, Polyparaphenylene, Polyaniline, Polyfuran, Polythiophene etc. are some conducting polymers.

See the figure? It shows the conductivity range of conducting polymers.



They can have a wide range of conductivity from that of insulators to metals. You can also see a conductivity ladder in which conductivity of some of the conducting polymers are marked along with some metals. Copper has the highest conductivity of approximately 10^6 S/cm. Polyacetylene doped with AsF_3 can have conductivity very near to that of copper. See the conductivity values of other conducting polymers? All of them are above 1 S/cm. Just for comparison, shall we see the conductivity of some of the conventional polymers? PE: 10^{-16} S/cm, PET: 10^{-20} S/cm, Teflon: 10^{-21} - 10^{-24} S/cm. Well, I don't see any comparison at all!

Umm... after all, the title is not nonsense as it sounds!

Coral Reefs - Indicators of Paleoclimate

Dr. Anu Gopinath

Paleoclimatology is the study of the weather and climate from ages past. The word originates from the **Greek root word "paleo-,"** which means **"long ago"** which combined with **"climate,"** means weather. Scientists and meteorologists have been using instruments to measure climate and weather for only the past 140 years! How do they determine what the Earth's climate was like before then? They use historical evidence called **proxy data**. Examples of proxy data include tree rings, ice cores, frozen pollen and ocean sediments. Studies reveal that the Earth's average temperature has increased approximately **1°F since 1860**.

Past climates leave their imprint in the geologic record in many ways. For temperature reconstructions, the most widely used geochemical method is the measurement of **stable isotope ratios**. Samples for climate reconstruction have in common that their isotope composition depends in a sensitive way on the temperature at the time of their formation.

The weather data that scientists have collected in the past 140 years will not be sufficient to answer these questions, so scientists use paleoclimatic studies to determine if today's warming climate has occurred any time in the past. Through past climate studies, scientists can predict the future climatic trends.

Corals form skeletons by extracting **calcium carbonate** from the ocean waters. When the water temperature changes, calcium carbonate densities in the skeletons also change. Coral formed in the summer has a different density than coral formed in the winter. This creates seasonal growth rings on the coral (like rings on a tree). Scientists can study these rings to determine the temperature of the water, and the season in which the coral grew. **They mainly depend upon oxygen and carbon isotopic ratios in growth bands of corals to reconstruct past Sea Surface Temperature(SST) and ocean chemistry.** By using these growth bands, scientists can date the coral samples to an exact year and season.

The main paleoclimatic indicators have been the abundance ratios of **oxygen isotopes in water as well as oxygen and carbon isotopes in carbonates**. The difference in physical properties caused by the mass difference leads to temperature dependent isotopic fractionations during phase changes and chemical reactions. The products which results from the interaction of water and its surrounding environment can be preserved over time and thus **isotopic signature, serve as a proxy record** of past climate change.

Several studies points to the fact that global climate change will lead to the following changes over the next century:-

- **Increased air and sea surface temperatures**
- **Rise in sea level**
- **Changes in weather patterns**
- **More frequent storms, droughts, floods and other extreme weather in some places**
- **Possible alteration of ocean circulation patterns**
- **Changes in seawater chemistry due to increased carbon dioxide concentrations**

Paleoclimatology using corals has wider implications for climate change today. Scientists often consider past changes in environment and biodiversity to reflect on the current situation, and specially the impact of climate on mass extinctions and biotic recovery. The use of corals as paleoclimatic indicators also points towards a high demand for the conservation of a highly sensitive and productive ecosystem named as tropical rainforests of the ocean i.e. "Coral reefs"

National Science Day - 28th February

Reshma C.A. II B.Sc. Chemistry

National Science Day is celebrated in India on 28th February of every year to mark the discovery of 'Raman Effect' by Sir. C.V. Raman. It was on 28th February 1928 the great Indian Physicist Dr. C.V. Raman found out that when a beam of monochromatic beam of light is passed through organic liquids such as benzene, toluene, carbon disulphide etc. the scattered beam consists of other frequencies in addition to the incident frequency. The scattering of light by a transparent medium with such a change in a frequency was named Raman scattering and the phenomenon was called by the name Raman effect. He discovered this effect while working in the laboratory of the Indian Association for the Cultivation of Science, Kolkata. Raman effect has vast applications in every area of science such as physics, chemistry, biology etc. The vast applications in every field of science had made this discovery a great achievement to the world of science and for that he received Nobel Prize in 1930. It was the first Nobel Prize for India. Hence the day is of great importance for Indian science and scientific community. So "National Science Day" is commemorated in the honour of Sir. C.V. Raman for his legacy, who has discovered Raman effect on 28th February 1928.

To honour him and his great achievement to the world of science, in 1986, NCSTC took initiative to get the Government of India to designate February 28 as the National Science Day (NSD) which is now celebrated all over the country in schools, colleges, universities and other academic, scientific, technical, medical and research institutions. On the occasion of the first NSD on 28th February 1987 NCSTC announced institution of National Science Popularization awards for recognizing outstanding effects in area of science communication and popularisation, which have been given annually since 1988.

Besides commemorating the event, National Science Day have several objectives. It highlights the contributions of science to human kind in the domains of disease eradication, energy production, space exploration, environmental issues, information technology etc. It emphasized biotechnology's impact on agriculture, environment, health, industry and medicine. It gives the space for exchange of thoughts on the gospel of reason and experimental observation that helps scientist to acquire mental and intellectual excellence. It provides the information on application of science in the daily life. It motivates to inculcate scientific temper among the school children. All institutions organise several programs on National Science Day based on above objective. Eminent Scientists and Professors of the present day give seminars on the most happening subject of science.

Indian Nobel Prize Winner in Chemistry

Nayana Rajan, II B.Sc. Chemistry

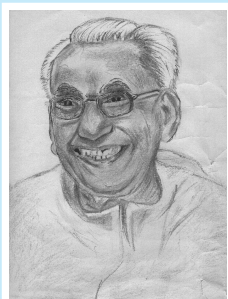
Venkatraman Ramakrishnan

V. Ramakrishnan is an Indian born American structural biologist, who shared the 2009 Nobel Prize in Chemistry with Thomas A. Steitz & Ada E. Yonath for studies of the structure & function of ribosome.

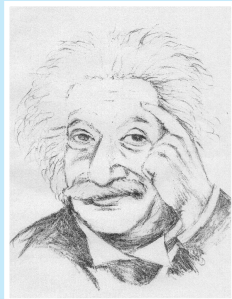
He was born in Chidambaram in Cuddalore district of Tamil Nadu in the year 1952. Ramakrishnan began work on ribosomes as a postdoctoral fellow. He continued to work on ribosomes during 1983-95 as a Staff Scientist at Brookhaven National Laboratory. In 1995 he moved to the University of Utah as a Professor of Biochemistry. In 1999 Ramakrishnan's laboratory published a 5.5 Angstrom resolution structure of the 30S subunit. The following year his laboratory determined the complete molecular structure of the 30S subunit of ribosome & its complexes with several antibiotics. This was followed by studies that provided structural insights in to the mechanism that ensures the fidelity of protein biosynthesis. More recently his laboratory has determined the atomic structure of the whole ribosome in complex with its tRNA & mRNA ligands. Ramakrishnan is also known for his past work on histone & chromatin structure.

He was awarded the 2007-Louis Jeantet Prize for Medicine, the 2008 Heatley Medal of the British Biochemical Society & the 2009 Rolf-Sammet Professorship at the University of Frankfurt. He also received India's second highest civilian honor, the Padma Vibhushan in 2010.

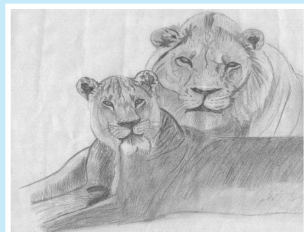
KALEIDOSCOPE



Saritha Gopal, IIInd B.Sc. Chemistry



Betsy K.J, IIInd B.Sc. Chemistry



Treesa E.J, IIInd B.Sc. Chemistry

Aiswarya V. Nair
Ist B.Sc. Chemistry

നീൽ മനോഹാരിത

നിന്നിൽ ഞാൻ ആദ്യം പതിച്ച കാലടികളും,
നിന്നിൽ ഞാൻ ആദ്യം കണ്ട പുച്ചെടികളും
നിന്നിൽ ഞാൻ ആദ്യം കണ്ട ചേദനകളും,
മനസ്സിന്റെ കോണിൽ പതിഞ്ഞപോലെ.
നിമിഷങ്ങൾ പോയതറിയാതെ നീങ്ങുന്ന,
നിന്നിലെ ജീവന്റെ സ്പന്ദനങ്ങൾ
നിന്നിൽ വിരിയുന്ന പൂവുകളിൽ
തേൻ നുകർന്നെത്തുന്ന വണ്ടുകളും
നിൻ മനോഹാരിതയിൽ
മുങ്ങിനീരാടി പാടുന്ന മരങ്ങളും
നിന്നെ തഴുകിയൊഴുകുന്ന പുഴകളും
എന്റെ മനസ്സിൽ തെളിയുന്ന നേരം
നിന്റെ നെഞ്ചിൽ ചേർന്നുറങ്ങുന്ന
നിന്റെ സ്വന്തം കുഞ്ഞായ മാറുന്നു ഞാൻ

