



# SPECTRUM

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## Focus on strategic electronics vital to India: Saraswat

### A Spectrum Reporter

With the demands and functionalities moving away from large-sized forms to miniaturisations for multi-purposes, the discipline and application of strategic electronics has come to be of critical importance not only in civilian areas but also in the realm of defence and missile applications, says Dr. V Saraswat, the Scientific Advisor to the Raksha Manthiri (Defence Minister).



*Dr. Saraswat addressing the plenary session*

Dr. Saraswat, who is also the Director General of the Defence Research and Development Organisation (DRDO), made his comments as Chair of the Plenary Session on the Strategic Electronic Sector as a part of the 98th Indian Science Congress at SRM University. Known in India and the world as one of

the pioneers who put India in the missile map for his deep involvement with the "Prithvi", the surface-to-surface missile, Dr. Saraswat told the audience that strategic electronics has been the actual pioneering area globally that was initiated

keeping the civilian requirements in mind but quickly moved on to other critical areas such as atomic energy, space and defence. And this because of the centrality of three areas -for speed, miniaturisation and computation.

Strategic electronics is discipline-based, Dr. Saraswat pointed out, going on to talk about the various aspects of the discipline that are unique in their own way but also inter-related. Radar, communications, missile, computational, space, nuclear

plant and nano electronics are some of the disciplines in the framework of strategic electronics, the distinguished scientist explained.

Radar electronics, for example, which was once 'fixed' had moved away to a 'roving' format with a multi-function and multi-mode functionality and focused on very small targets.

"There has been a tremendous growth in electronics military communications," Dr. Saraswat maintained, pointing out to a 'reverse flow' in this sector. At one time military technology seeped into the commercial realm, but it is now the other way around. Advances in military communications

↳ P2

## Growing children's participation, a healthy sign



*The Registrar (Second from Right) at the Valedictory ceremony*

### Anuj Srivas

"The Nobel Laureates were impressed with your performance," Dr. N Sethuraman, Registrar of SRM University, told youngsters attending the Children Science Congress.

Speaking at the Valedictory Function, Dr Sethuraman pointed out how much the Children's Congress has changed over the last five years. Originally it started to involve children in the spirit of the Indian Science Congress, but it has grown to such an extent that children

↳ P3

## Today's Schedule...

9.00 am - 11.00 am	Plenary Session Agriculture, Biotechnology, Food and Nutrition Security Venue : Dr. T.P. Ganesan Auditorium
9.00 am - 11.00 am	Plenary Session Biodiversity: Focus on fragile coastal ecosystems Venue: Main Pandal
11.00 am - 1.00 pm	Plenary Session Nano materials and Nanotechnology Venue: Dr. T.P. Ganesan Auditorium
11.00 am - 12.00 noon	Special Lectures Venue: Auditorium Hall II
12.00 noon - 1.00 pm	Special Lectures Prof. H.S. Sharma & Prof. Ramesh Goyal Venue : Auditorium Hall II
12.00 noon - 1.00 pm	Dr. Shantanu Shanthanam Venue: Auditorium Hall I
1.00 pm - 2.00 pm	Lunch Venue: Sannasi Hotel
2.00 pm - 5.00 pm	Rastriya Vigyan Chalanchitra Mela Felicitation and Presentation Session Venue: Auditorium Hall I
2.00 pm - 4.00 pm	Sectional Sessions
3.30 pm - 4.00 pm	Tea Break
4.00 pm - 5.30 pm	General Body Meeting Venue: Dr.T.P.Ganesan Auditorium
5.30 pm	Valedictory function Venue: Dr. T.P. Ganesan Auditorium

# Shamsudeen finds solution to stop earthquakes

Ratnika Sharma

With thousands of people perishing globally every year from earthquakes, the big question is if this natural calamity can be prevented. The answer to this query would be an emphatic “YES” from the invention scientist MA Shamsudeen, currently associated with a major project on the subject at SRM University.

The research team consists of Ojas Mahapatra, Shivaraman R (alumnus of SRM), Mr. Shamsudeen and Prof M. Ponnavaiko, Provost and Chief Academic Officer at SRM University.

The conventional wisdom is that earthquakes occur due to plate tectonics; but this long held hypothesis has been brushed aside by the SRM team that has effectively argued and proved that earthquakes occur due to gaseous explosions under the earth’s surface.

This leads to the larger question of whether such gaseous explosions can first



M A Shamsudeen

be detected and subsequently stopped.

The team built a simulation system - in association with Bharathidasan University - with a view to demonstrating that gaseous explosions cause earthquakes and successfully tested it.

Mr. Shamsudeen has been working on this line of thinking for the last 54 years and the team led by him presented a paper in International Geophysical Conference and Exhibition,

2007 in Perth, Western Australia. The team went all over the world to find the earthquake epicenters.

He explained to Spectrum the working of the Earthquake Stopping Unit that consists of a perforated tube - that is rust and fire proof - drilled into the ground at the site of the epicenter. The gas travels through the tube and into a tank that is then sent for study in the lab. The unit has a safety valve and a gauge to measure the pressure of the gas.

His appeals for help to find a solution to stop earthquakes fell on deaf ears all these years. Finally SRM University came to his rescue and set up lab, provided financial and material assistance. “SRM University is a world savior in the sense that success in this research venture will help India and countries that are hit hard by this phenomenon,” Mr. Shamsudeen remarked and thanked the Chancellor and the Provost for helping at the right time.

# Clean, affordable energy a dire need

Ashish George

Energy has to be in everybody’s reach with ease, said the Life Time achievement award winner Dr. Baldev Raj, Indira Gandhi Centre for Atomic Research (IGCAR). He was chairing a plenary session on ‘Science and Challenges in Energy Security’. The energy requirement is increasing at a very high rate, but we cannot dry our earth with complete lack of concern and still expect her to remain healthy, said Dr.Raj. There is a dire need to find a clean and affordable source of energy, nuclear and solar energies are some of the current solutions, he said. Complete dependence on fossil fuels and other non-renewable energy sources will lead to complete degradation of natural resource and environment, he added.

Prof. Seeram Ramakrishna, Vice President (Research Strategy) threw light on increasing innovation in Asia in the field of solar energy, due to expansion in the number of research and development institutions. Increasing urbanization is demanding more energy supply day by day, he exclaimed. Solar, wind and nuclear are promising

energy sectors and we need to make them available to all at a very reasonable price, said Prof. Seeram.

Mr. O.P Bhutani, Director, R&D, Bharath Heavy Electricals Limited (BHEL) talked about efficient utilisation of energy and its distribution. “There are huge R&D challenges that need to be worked upon”, he said. We have the largest pool of scientists so we can do this, he added.

Dr. Alan E. Waltar, Senior Advisor to the Pacific Northwest National Laboratory (PNNL), US considers nuclear energy as the best solution to the energy crisis, which can also be used in desalination and hydrogen production. The waste disposal seems to be the main concern for many, but actually the waste produced is very small, and can even be considered as an attribute, said Dr. Alan. “We need all the resources, but the major concern is to combine them intelligently to get cleaner, safer and efficient energy,” he said. Dr. Stefano Galli highlighted the methods of efficient power transmission.

# Have fire in the belly for a better future : Saraswat

**Dr. Vijay Kumar Saraswat** is the chief scientific advisor to the Indian Defence Minister and the Director General of Defense Research and Development Organization (DRDO). Excerpts from his interview to Spectrum’s Avani Khandelwal:

**Question: How would you rate the missile programmes of India?**

**Answer:** I can only say that a lot of efforts are being made to improve the missile programmes. In the past 20

years, India has come up in its missile programmes a great deal with a series of missiles – 3 Agni missiles, Akash, and Prithvi.

**Q: What are the future plans and projects?**

**Ans:** Generally, a missile has a life of 10 years. So, new weapons are designed, produced and manufactured from time to time to overcome the faults and shortcomings of the previous generation of weapons.

**Q: In the regional scenario, how prepared are we to be on a par with the other powers like China?**

**Ans:** Today, our country is very well-equipped with arms and ammunition. We are powerful. The research and development of this segment is also going on in full swing. So we definitely have a formidable stance in the current regional scenario.

**Q: Any message to the student fraternity?**

**Ans:** Now the country needs innovative ideas from students. Work with passion, sincerity, dedication and hardwork. I want the students to have fire in their belly for a better future in research and development and achieve success in every mission they pursue! Good Luck!



Dr. Saraswat

# Focus on strategic ...

↳ P1

are critical for navies for the reason that submarines operate in very low frequency areas. “Research in our country is not in a big way,” the top DRDO official remarked.

In the context of India, the importance of Dr. Saraswat’s presentation would be of critical relevance and importance in at least two areas: electronic warfare and surveillance. With the rapid advances and changing strategic planning, electronic warfare has assumed vital focus in many areas of the world. “We need to have

a strong electronic warfare community,” Dr. Saraswat said.

Conferred the Padma Shri in 1998 for his outstanding scientific contributions to India Dr. Saraswat spoke of the importance of surveillance to India, both in an internal and external contexts. “We have to keep track of our borders. And it is also vital for our para-military forces,” he said.

“We use the camera in our cellphones. But what we don’t realise is that the basic sensor comes from the outside,” Dr. Saraswat quipped.

“Today, our country is very well-equipped with arms and ammunition. We are powerful. The research and development of this segment is also going on in full swing”

# Amutha's virtual eye guides blind kids

**Ratnika Sharma**

"A momentary distraction of attention, unexpected obstacle, unnoticed important signal or mistakes while climbing steps may result in a loss of orientation and force a blind person to seek help from other people. Unaided walking in unknown environment, even when the individual's place of living is in the neighbourhood, severely tests the capacity of the blind," said Ms B. Amutha, Research Scholar in the Department of Computer Science Engineering who built the Virtual Eye, a device for guiding the blind people, under the guidance of Prof. M. Ponnaivaiko, Provost and Chief Academic Officer of SRM University. It is essentially invented to benefit the visually impaired young children to locate their paths.



Dr. Amutha



The prototype of the device

The device uses Global Positioning System (GPS) and the Zigbee modules that are combined in such a way so as to identify the landmarks. A few basics would have to be borne in mind in order to come to terms with the requisite technology: What is the blind person's current location; What

is the likelihood of obstacles at various locations; What are the possibilities for obstacle avoidance; What would be the safest path for a goal/exit Zone?

Several modules are used in the project to obtain the desired results such as 'location sensing' to determine the geographical

location of the child on the earth using GPS; 'Obstacle detection' with the help of sonar technology; moving the obstacle detection by using the consecutive measurements made from the ultrasonic sensors in all the four directions; and 'path guidance', a module used to guide a path in order to avoid

collision.

The ultimate product will be the size of a cell phone and will be put on a belt connected to a set of headphones. The obstacles in the blind person's way will be identified by a set of sensors that will enable the voice processors in the device. Appropriate commands will be given to the user through the headphones. In addition to it, the location of the child determined with the help of GPS technology and status of the obstacles will be automatically sent to his/her parents via text message.

"This is a system-level approach to the problem of localising and tracking a blind person carrying a portable terminal" said Ms Amutha.

## 'Need to develop eco-friendly drug development technology'

**C Sahana and R Krishnan**

"It takes 12 years and \$400 million to successfully introduce a drug in the market" said Dr. Ramendra Pandey, Director, Analytical Operations, Pharmaceutical Product Development (PPD). He called upon the youngsters to work on getting this down and making such life saving drugs more accessible.

"Drug making is a noble way to make money," said Dr. Sridhar Desipan, Biocon, BMS R&D Centre, Bangalore. He then talked about the drug taxol, a potent anti-cancer natural

product made of pacific yew tree. One tree contains 0.002 per cent taxol and therefore a whole forest had to be destroyed for collecting the quantity required to save one patient. He therefore stressed on the need to develop eco-friendly technology.

"The average cost of developing a drug is around \$800 million and there is a compelling responsibility to develop low cost drugs," Dr. PK Seth, Chief Executive Office, Biotech Park, Lucknow said. He also noted that the government and the private sector jointly fund drug development programmes.

## Growing children's ...

↳ P3

all over India are now sending letters wanting to participate in the next edition, he noted.

According to him, the participation of children from rural areas was a good indication of the importance of this event. "It is a good sign that so many students are interested in science. It bodes well for the betterment of our society," he said. Dr. Amit De presented the Infosys

– Indian Science Congress Association (ISCA) Awards to 10 children who had sent in the winning entries. "We asked each participant to send a write-up of their favourite recent scientific development, and these 10 proved the best," said Dr De. Children and scientists working together result in brighter future for all of us, he added. Dr Mythili of SRM University proposed a Vote of Thanks.

## Challenges in deploying a missile

**Rahul Preeth**

The major challenging part in deploying a missile is to gather information of the missile; that travels at 7–10 kilometres per second, process the data and execute it on time, not only to hit the locked target, but also to hit at its most vulnerable part, said Prof. Avinash Chander, Director Advanced Systems Laboratories, DRDO. He was speaking on 'Strategic Electronics in Defence' as part of a plenary session that discussed 'Strategic Electronic sector'.

Introducing some of the best missiles from the countries' arsenal, he maintained that; range, propulsion system, direction and safety of warheads are the crucial driving factors that determine the strike ability of a missile.

"The final key to the performance of the missile lies in the ability to deliver the war heads at the appropriate range with the desired accuracy and that is where strategic electronics plays a vital role," Prof. Chander said.

He assured the gathering

*"The final key to the performance of the missile lies in the ability to deliver the war heads at the appropriate range with the desired accuracy and that is where strategic electronics plays a vital role, Prof. Chander."*

that the country has a sound defence system with the advent of modern technology, especially in the strategic electronics sector and indigenously developed novel prospects of designs like the Micro Electro Mechanical Systems (MEMS).

Prof. S.K Kaul, Centre for Applied Research in electronics, IIT, spoke about the 'Futuristic Trends by Strategic Electronics', acquainting the audience of

the need for a better wireless communication technology, in entities like medical application and missile systems.

"Everything in the future will be wireless", he maintained.

He gave a detailed description of the researches under way in strategic electronics in India like the multi-function monolithic microwave integrated circuit modules and microwave and millimetre wave wafer level components, among the other research projects.

He stressed the significance of having a "bottom-up" approach; that is, to develop own ideas from scratch if need be, rather than buying equipment from other countries and later dismantling them, to piece together the technology behind them. It is almost insurmountable to do so as the technology is so advanced and there are too many intricate details to a machine to be learned about, he said.

Among many other suggestions, he urged the introduction of Radio Frequency or RF electronics and RF nanotechnology courses at under-graduation and post-graduation levels.

# Photo Fea



*Tech Park at night*



*The future of India at the Science Ex*



*Enjoying lunch... VIP style*



*The valediction of the Children Science Congress*

# ture . . .



*High School students at the science exhibition*



*Solar panels for heating water*

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*Students of SRM Institute of Hotel Management along with their Vice - Principal*

## Experts throw light on recent advances in 'Asthma Research'

**Geetha Veliah**

There was a galaxy of medical stalwarts who are all pioneers in various aspects of Airway Smooth Muscle Physiology, Hyper responsiveness and therapeutic intervention for the plenary session on Medical Sciences. The topic for discussion was recent advances in 'Asthma Research'.

The Panel comprised Dr. Parmar, the chairperson for this session, Dr. Thomas Murphy, Dr. Tirumurgan, Dr. Chun Seow, Dr. Devendra Agarwal and Dr. Harish Sharma. These scientists deftly handled topics, discussing the role of IgE receptors in Hyper responsiveness to Angiogenesis of Tissue remodeling in Chronic Lung Diseases.

Although it was Dr. Parmar who discussed the role of neurotransmitters and transitioned into the topic of the session – Recent Advances in Asthma, the first speaker was Dr. Thomas Murphy, a pediatrician with special interest in pediatric asthma. He gave an overview of the resistance in treating Asthma as seen in the United States and anecdotally shared that the same will happen in India in due course of time.

The second topic that was originally scheduled to be delivered by Dr. Mathu Kannan, had to be by Dr. Tirumurgan, his colleague in this research study. The role of CD38 / ADPR in Airway Smooth Muscle – A therapeutic target in Asthma was the topic of his research.

Dr. Chun Seow, from the University of British Columbia who has conducted extensive research on mechanics of Airway functioning, started with an introduction to asthma and continued about ASM dynamics. He also addressed the common pathway of airway obstruction in Asthma. From his study he concluded that the amount of Airway Smooth muscle is increased in asthmatic airways and there was significant difference in response to oscillation strain in the research study.

Dr. Devendra Agarwal from Creighton University who has had grounding in Biochemistry, Medical Science and Pharmacology has his research focus through varied lens. The topic he addressed was Immunomodulation in Therapy of Bronchial Asthma.

Dr. Hari Sharma, an eminent researcher from the Institute of Cardiovascular research, VU University, Amsterdam. The topic was the Angiogenesis of Tissue Remodeling in Chronic Lung Disease. Dr. Sharma in general addressed chronic lung disease which included both Asthma and Chronic obstructive Pulmonary Disease.

## Parasite threat predominant in rural areas

**Maheswari M D**

"The World Health Organisation (WHO) statistics confirm that parasites are the chief cause of death after HIV/AIDS and TB," said Prof. R.C. Mahajan. He is the S. N. Bose Research Professor (INSA), P. G. Institute of Medical Education and Research, Chandigarh.

Speaking at the memorial lecture on the theme Parasitic Diseases: Indian Perspectives, he said the climatic conditions of tropics favour breeding/survival of parasites. Parasitic infection is also found to be predominant in rural areas due to primitive sanitation, poor housing and limited access to health care. Parasites' complex life cycle demands management, infrastructure and financial resources, for controlling the spread of disease, he said.

He mentioned the top 10 human parasites, based on a study made by the WHO' which include

Ascaris, Hookworm, Malaria, Amoebae and Filariasis. Malaria is the most prevalent disease in India affecting millions of people of whom most are poor.

Malnutrition was found to be the major problem for the endemicity of various infections and it also increases morbidity and mortality. "Micronutrients do play a part in preventing complications of the infection," Prof Mahajan stated. Micronutrient like Zinc reduces malaria occurrences and parasite density.

Malaria in pregnancy will cause birth of babies of less than normal weight and may lead to even complications like cerebral malaria and will also affect a person with anaemia. He recommended that higher investment in research and development programmes related to health infrastructure and better communication/collaboration among scientists and policy makers in developed and developing countries in multidisciplinary fashion can certainly reduce if not eradicate disease burden.

## Age no bar to fulfil dreams

**Haripriya Madhavan**

What normally an adolescent dreams of becoming, is a doctor of medicine or a software engineer. But teenager Ajith has welded together a wireless remote - controlled lock to render mad elephants ineffective. His keenness to repair remote controlled toy-cars sparked the idea of making a machine that can lock the legs of musth elephants and automatically inject an anaesthetic, thus preventing them from attacking humans. The project was at display at the Children Science Congress Exhibition.

The 16-year old from Kerala was inspired to assemble an 'elephant controlling system' after witnessing many elephant attacks in his state's temple festivals. Hailing from the remote village of Kaniyambetta in Wayanad district, Ajith found out from books on electronics how to fix the simple circuits together on his own, in just a month. The system can be operated with a wireless remote or a laser.

The project won him a scholarship from the Mahindra Company. His ambition is to be an electrical engineer and he intends to get this idea patented once he is

*"The current trend among students is to choose courses like MBA. Through these events, we aim at inculcating a scientific temper in children and spur them on to take up careers in science."*

18. "My next idea is to develop an automatic alarm fence made of iron plates, which when stomped upon by elephants will produce tiger growl sounds. This will chase the elephants away from venturing into villages thus preventing human-animal conflicts" he explained.

Speaking to Spectrum, R.S. Raghuvanshi from NCSTC Network, one of the organizers of the Children's Science Congress Exhibition said, "The current trend among students is to choose courses like MBA. Through these events, we aim at inculcating a scientific temper in children and spur them on to take up careers in science". The exhibition was of high energy levels with children of all ages, staging their innovations that excited the visitors no end.

## Industry ever supportive of DAE, ISRO

**C Sahana**

The increase in unit size of the nuclear reactors from 700-16560 M v and implementations of many new technologies are considered as the significant progress in the nuclear reactor sector, said Dr. Sudhinder Thakur of the Department of Atomic Energy (DAE).

He was delivering a special lecture on Enhancing academia – industry interactions at the Indian Science Congress. Stressing the contribution of the industry to the DAE, he said

the nuclear components such as grid plate for the fast breeder reactor, fuel cycle are the recent contributions of the industries. Integrated energy policies of the nuclear power programme were also explained.

The unity in work, estimation of the cost, addressing the Human Resource and training needs of the new recruits are considered the future plans of nuclear programme, Dr. Thakur noted.

The indispensability of the industries to the Indian Space Research Organization

(ISRO), Bangalore was emphasized by Dr. Madhusudhana of the institute. 'We grow as the industries grow with us'. Industries' participation, purchase policy, contribution of the components from the industries to the ISRO are the key factors in space research programmes. 'Industries also have shares in the ISRO's budget plans'. Apart from the risk factors, developing policies such as rendering training for those from the industry and buy – back assurance from the industries, spare time entrepreneur were also highlighted.

The ISRO is having many future plans. The 10th plan is to launch 4 PSLV and 3 GSLV missiles at a cost of Rs. 12,615 crores and the 11th is to get ready 14 PSLV and 4 GSLV at a cost of Rs. 22 crores.

At the end of the session, Dr. R. Chidambaram, scientific advisor to the Prime Minister who chaired the session, remarked that the industries are very supportive of the nuclear and the space programmes and are solidly behind their string of successes.



Dr. Antony Ashok Kumar

## Quality dining at SRM

**Pavithra Rajagopal  
and Ratnika Sharma**

The VIPs present for the 98th Indian Science Congress had not only a taste for the width and depth of the convention but also the wonderful hospitality of the SRM hotel and catering. They are provided with morning snacks, lunch and dinner at the Main Pandal and the cellar of the Tech Park. SRM Hotel along with the assistance of the students of SRM institute of Hotel management (IHM) provide a mix of Indian, Chinese and regional cuisine consisting of both vegetarian and non vegetarian fares.

The spread for both vegetarian and non vegetarian has to be seen to be believed - changing mix of main course, salads, soups and desserts put together by some of the well known chefs Ramesh and Ganesh Murty in the Tech park, and chefs Nageshwaran, Anand Dilipan and Sauvraj (pastry) in the Main Pandal along with senior supervisory staff like Mr. Saravana Kumar and Mr. Harry George.

Dr. Antony Ashok Kumar, General Manager, SRM Hotel is the person behind the whole show both in terms of organisation and logistics.

"We as a team wanted to make this event successful and memorable. The menu that was laid out covered the four corners of India," Dr. Antony said

To give an idea as to the extent of service provided every day, snacks lunch and dinner are being provided to about 800 people in the Tech Park and to around 150 people in the Main Pandal. The food is being prepared by SRM Hotel staff and served by the students of IHM. The first year students help the chefs with the 'Misen Place' -- preparation of the ingredients for cooking. Bipul Vishal, II year, IHM, said that it has been a good hands-on experience for them and provided them with the opportunity to interact with eminent scientists and delegates.

"Selection of menu, presentation, service quality and courteous helping out of delegates are amazing. The atmosphere is pleasant and very welcoming," commented Dr. Geetha Bali, General President- Elect. ISCA Executive Committee.

# 'Early detection necessary to avert cancer deaths'

**Komal J and Aravind.T.S**

Making modern health technology easily accessible to the people, encouraging new methods related to diagnostics, and lessening cumbersomeness of treatment procedures, all of these making prevention easier is the main goal of the Indian Council of Medical Research says K.M.Katoch, Director General of the Council. The ICMR serves as a fulcrum for generating knowledge as well as involving itself in transnational research. To take the fruits of this effort across the country, 26 translational units have been established in the last two years in the various ICMR institutes. It also plays a significant role in the development of reagents for H1N1 and has contributed to the Revised National TB programme.

Dr.Katoch, Chaired a Plenary session on 'Perspective of Human Health and Disease in Modern Society,' a panel that devoted its time to examining how widespread are diseases in India and overseas with a view to highlighting the new diagnostic methods available in the medical community. In the Centenary year of the ICMR, Dr.Katoch traced the origin and growth of the prestigious institution together with the priorities.

"Passion and Profession together can bring innovative products" said Dr.Srinivas Pentylala from the Stony Brook Medical Centre, USA. He mentioned that the market for Rapid Point- of- Care (POC) diagnostics tests is large, as there is potential application in many areas. Utilization of POC products is growing at a rapid pace in the global market and the economic impact from these POC diagnostics is huge. He discussed several strategies ranging from idea to invention, prototype product, basic research to clinical research and manufacturing to marketing of POC rapid diagnostic products. This encompasses many areas like cancer, diabetes, Infectious diseases as well as identifying toxins, drugs of abuse.

Koichi Kato from National Institutes of Natural Sciences, Nagoya City University, Ochanomizu University, Japan, spoke about structural studies of the glycoconjugates of clinical interests underscoring the significance of the sugar-protein interaction systems as potential therapeutic targets. More than half of the proteins in nature are estimated to be modified by the sugar chains. The glycosylation affects the physical and biological properties of proteins and influences a functional protein - protein interactions. Hence, glycosylation is now considered to be one of the most

important factors in the design and development biopharmaceuticals such as antibody medicines.

Dr. Hafiz Ahmed, University of Maryland School of Medicine and Greenebaum Cancer Centre, USA spoke about the recent development In Cancer diagnosis and Prevention. The threat stills remains when the killer disease snatches away approximately seven million lives the world over. However cancer deaths can be reduced or prevented if the disease is detected at an early stage. The introduction of advanced sophisticated technologies like proteomics, mass spectrometry, microarray, automated DNA sequencing, comparative genomic hybridization and epigenetics have hastened the search for new cancer biomarkers that may be useful for non-invasive early detection. However, two or multiple genes cohort such as GSTP1/galectin-3 or GSTP1/RAR $\beta$ -2/APC has been shown to be more specific and sensitive biomarkers for prostate cancer.

Dipak.K.Banerjee, School of Medicine, Univeristy of Puerto Rico, San Juan, USA spoke about "A New Dawn in Breast Cancer Therapeutics" regretted that cancer affects one in every eight women worldwide and kills one in four is becoming and becoming a serious public health problem. The etiology of breast cancer is complex but this disorder is angiogenesis dependant. In this critical process there is a dynamic balance

between pro- and anti-angiogenic factors that has shifted by the conditions created by tumour. As we all know treatment is critically expensive and accompanied by a host of adverse side effects that are detrimental to a patient's quality of life. He hypothesized that interfering with the lipid linked oligosaccharide (LLO) assembly could affect angiogenesis in vivo and eliminate the breast tumour growth. He concluded that Tunamycin has the necessary potential to succeed as the glycotherapeutic treating breast cancer in the clinic.

Bishnu Pada Chatterjee, West Bengal University of technology spoke about the global scenario of Hepatitis; prevalence, diagnosis and treatment. Of the 200 crores who have been infected worldwide, more than 350million are prone carriers of Hepatitis B Virus (HBV). This infection accounts for 1.2million deaths each year. Therefore early diagnosis of chronic liver diseases becomes a crying need. The large population of patients worldwide who are chronically infected with HBV and Hepatitis C Virus (HCV) creates an enormous burden of illness related to chronic infection, cirrhosis, liver failure. The HCC related mortality could be reduced to an appreciable extent by a dual approach of integrating vaccine into all national immunization programmes and safe-effective treatment is necessary. Improvement of sanitation and safe drinking water are commended as essentials.



Dr. Katoch, Director General of ICMR

# Nurture nature for better future

**Archana Arul and Maheswari. M. D.**

The predominant concern of the young minds, present in the Children Science Congress, is conservation of natural resources by using renewable energy.

The realisation is that inheriting the earth is no longer the norm; rather it is a question of "borrowing" it from the younger generation. The bottomline consensus is that alternative sources of energy like wind, solar, hydel, geothermal and biomass, to mention a few,

are to be used effectively for the betterment of the future generation.

Sailesh Patra of class X, DAV Public School, Angal, showcased his project of a modern windmill in the Children Science Congress. It is a simple innovation that produces electricity of about 24W. He said his modern windmill is cost-efficient, consumes less space, and non-pollutant when compared to the traditional one. Traditional windmill, he said, requires wind speed of 15 kmph while his model requires just 7 kmph wind speed.

The budding scientist said he is now conceptualising a 'Future Windmill' that will consist of an outer Helium layer and when installed in the 'Jet stream Layer' of the atmosphere will produce 20-22 MW of power. He said, "This will cost Rs 25 lakhs, while the traditional one will be over Rs One crore."

V Shakti Priya of Kendriya Vidyalaya I, Madurai developed a Chlorofluorocarbon (CFC) free air cooler, which drew major attention.

She said her air cooler follows the same simple mechanism of the elevating vertical grass mats that screen the chambers of the Rambagh Palace in Jaipur, in order to filter air.

She said, "There are better ways to stay cool, other than contributing to global warming." The advantages of the model are low cost, less power consuming and no humidity output.

She said that although her model takes more time to cool the room when compared to the air cooler as she has used

an earthen container to cool water, it is more eco-friendly.

Similar projects reflecting the environmental concerns of students were Joshi Maitri's soil conditioner that used Sulphur from the industries as a nutrient for plants and Ritu Rajesh Barot's bricks, which are made of soil-friendly fly ash.

The exhibition proved to be a platform to cater to the scientific temper of the school children. Parents and faculty members accompanying participants were equally enthusiastic.



Dr. Gautam (Right) with Dr. Kasmir Raja, Dean, Research

## Government agencies asked to come together for producing science films

**Bragadish**

'There is a need for convergence of all government agencies which are producing science films' was a decision taken at the technical session on challenges of science film making, chaired by Dr Arvind Ranade. Vigyan Prasar conducted this technical debate between scientists and science film-makers as a parallel event within Indian science congress.

Mrs. Seema, a science film-maker who said that there is good viewership for science films cited her TV series 'Hum Zameen' which had good TRP ratings. She said the problem is in the technique of film-making and lack of good avenues for reaching the people.

Mr. Bharat, science film-maker expressed that the writing part should not lack humour but that should not dilute the subject. He urged producers not to feel insecure in using animation and VFX for better results.

Mr. Mehidul Rahman, an experienced science film producer stated film makers should try new medium like music video and rap for reaching the kids. He sought for a regular slot for science films in government controlled television and a separate science channel.

Mr. KS Madhu asked film makers to focus on local language and shared his experience of using folk songs which were

very well received.

The Rashtriya Vigyan Chalanchitra Mela conducts film festival for science films. Popular science films, short films on science and technology and

animation and graphics will be presented awards which will be given away by eminent film maker Adoor Gopalakrishnan on January 7

## Make people aware in safe-keeping the biodiversity: Gautam

**Prashanti Ganesh**

With climate change taking its toll on the bio-diversity system globally, Dr.P.L Gautam, Chairman, PPV-IndianAgriculture Research Institute (IARI), spoke to Spectrum about the preservation of biodiversity. "People should be made aware of the role they play in safe-keeping the biodiversity," he said.

Imposing restrictions on hunting and fishing, using resources sensibly and maintaining sustainability are vital. Creating general awareness among the people of the importance of the universe for various essential purposes in the future are ways in which the bio-diversity can be protected, according to Gautam.

"The conservation of certain crops is especially important because they might have particular characteristics that will be extremely important to us in

the future," he maintained.

Climate change has also made many animals lose their natural habitats and they might turn invasive and prone to extinction when forced to find a new place to live. "Some animals might find it difficult to adapt to new situations and might even threaten the existing fauna," he said.

India, being one of the most diverse countries, has been facing deterioration in the density of the flora and fauna lately. "Globally, there is a loss of biodiversity and India is not far behind," explained Gautam going on to talk about habitat destruction, invasion of living spaces as some of the primary reasons for such degradation of India's natural assets.

"Increasing need of humans for things like food, fuel and fertilizers proves to be a huge burden on the depleting natural resources," he said.

### 'There is a huge market for science films in India'

*When everyone considers making science films is a profitless venture, KS. Madhu has not only produced a science film in the animation category, but also made a profit out of it. Pupi2 is his recent animation film that has created a new market for science films in Kerala. K.S. Madhu, producer of the movie speaks about his experience to Spectrum. Excerpts from the interview:*

**Question: Tell us about your new movie Pupi?**

**Madhu:** Pupi is an animation science film in which a small puppy, which is a metaphor for dog, goes out and makes friends with other animals through which we create an understanding of life sciences for kids and we are planning to cover mathematics in the sequel.

**Q: How was the response for your film?**

**Madhu:** It was very good. We already sold 1.5 lakh

discs and day-by-day our sales are increasing.

**Q: How do you see the market for science films?**

**Madhu:** We have a huge market in India for science films. Science films are considered to be government funded projects but it can also be a business. Industry should realise this opportunity in science films and use it.

**Q: What is the main challenge in the process of science film making?**

**Madhu:** Script is the main challenge in science films. We have to balance both humour and information content in a right way so that children enjoy the film and also learn.

**Q: What are your future plans?**

**Madhu:** We plan to dub our film in all the south Indian languages and we are also working on a sequel of Pupi.