



103rd Indian Science Congress 2016 **ISC NEWSLETTER** *Science & Technology for Indigenous Development in India*

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Light has inspired Early Civilizations: Nobel Laureate Serge Heroche

-Shivendra G Urs

Mysuru: "I feel this is the right opportunity to talk about light, as the year 2015 has been declared as the year of light. The history of light itself is very interesting, as it inspired lives during very early civilizations" proclaimed Nobel laureate Prof. Serge Heroche speaking on 'What is Light? the Question Which has Shaped Our Vision of Nature' at 103rd Indian Science Congress



Prof. Serge Heroche speaking on 'What is Light? the Question Which has Shaped Our Vision of Nature' at 103rd Indian Science Congress organized by the University of Mysore, Mysuru.

Photo-Shivendra G Urs

velocity of light. Roemer later tried to find the velocity of light by studying the occultation of Jupiter's moons.

"In the early 1800s, interference of light vindicate was observed. In 1849, H Fizeau found a precise velocity of light, which is very close to the currently known velocity of light which is 300,000 km per hour" observed Prof. Heroche. Shedding light

organized by the University of Mysore, Mysuru.

Prof.Sarge said, the scientific answers about light were discovered in 17th century. Fundamentally, the experiment focused on whether light is a wave or a particle and what the velocity of light is. He added that, Galileo invented telescope and had also experimented to know the

on the invention of Magnetic Field he said that, Maxwell explained the way electric field and magnetic field feed each other. Maxwell found that, the velocity of light, is very close to the velocity Fizeau measured. Later Hertz and Roentgen discovered radio waves and X Rays respectively, he pointed out.

(Continued in p.3...)

There is Rapid Increase in Cancer Cases in India: Prof. Bamezai

-Shreeharsha C M

Mysuru: 'Cancer cases in India are lesser than they are found in Europe and America. But we cannot deny the fact that it is increasing rapidly in India' revealed Prof. R.N. K. Bamezai, former coordinator of National Centre of Applied Human Genetics, JNU, New Delhi while speaking on 'Genomic, Epigenomic and Metabolic Tuners in understanding Cancer' at 103rd Indian Science Congress at University of Mysore, Mysuru.

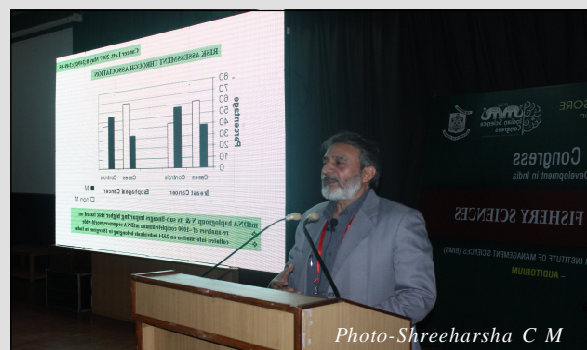


Photo-Shreeharsha C M

Prof R N K Bamezai, addressing the gathering on Epigenomic and Metabolic tuners in understanding cancer at 103rd Indian Science Congress at Mysuru.

Dwelling on advance in cancer treatment,

(Continued in p.3...)

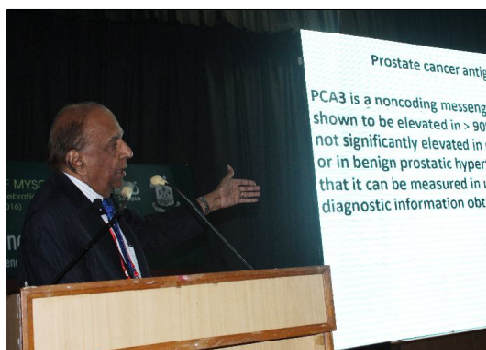


Cultural event at 103rd ISC at University of Mysore, Mysuru
P. Madhu

Research on Biomarkers to be Increased: Prof Krishna Dronamraju

-Shreeharsha C M

Mysuru: “Down syndrome is the first biomarker that was identified. It was observed that the trisomy in the chromosome 21 causes the Down syndrome” revealed Prof Krishna Dronamraju of Foundation for Genetic Research, Houston, Texas, USA while speaking on ‘Genetic and genomic biomarkers: Present status and future applications’, at 103rd Indian Science Congress at University of Mysore, Mysuru. Biomarkers (or biological markers) is a characteristic that is objectively measured and evaluated as an indicator of normal biological processes, pathogenic processes or pharmacological responses to



Prof Krishna addressing the gathering 103rd Indian Science Congress at University of Mysore, Mysuru

Photo-Shreeharsha C M

a therapeutic intervention. Lamenting over the paucity of the literature available on Biomarkers he called upon young scientists to take up more research in this field.

Dr Prasad D K Dhulipala speaking on ‘Biotechnology solutions for common problems in hydraulic fracturing’ said that “Hydraulic fracturing is a major technology which is being used in North America to expand natural gas production. It creates fractures by pumping fluids at sufficient pressure to fracture the rock”. He said that, in recent times, recombinant protein technology is used in developing and has replaced the old methods of hydraulic fracturing. The genetic sequences for the enzymes are more robust than conventional enzymes” he explained. He lauded the use of biotechnology in extracting natural gas.

India's Missile Woman Dr. Thomas Pitches for Women's Participation in Science

-Shivendra G Urs

Mysuru: Prejudices against women overshadow women's hardwork and honesty in their work said, Dr Tessy Thomas, Director, ASL, Hyderabad speaking on, ‘Women & Science in 21st Century – Opportunities and Challenges’, at the 103rd Indian Science Congress held at the University of Mysore, Mysuru. She lamented that, though women are being offered roles in science, technology, defense and aerospace there is still a long way to go to achieve parity.



Dr. Tessy Thomas, Director, ASL, Hyderabad speaking on, Women & Science in 21st Century -Opportunities and Challenges at the 103rd Indian Science Congress held at the University of Mysore

Photo-Shivendra G Urs

that, women entering research field is growing exponentially and this is a step in the right direction. Dr. Tessy said that being away from home and loved ones and focusing on her mission has taught her a lot and added that, she has learnt the ways to tackle stress and said women need to learn the art of tackling stress. Optimistic about greater role for women in science in future, she envisaged that “in a few years from now, individuals who master the sciences will change the world”.

Hailed as India's missile woman, Dr. Thomas observed that, “in modern society women need to enhance their knowledge, only 10% knowledge comes from books, 20% from process and remaining 70% from people”. Speaking about the importance of stress management she said “women need to manage stress in order to achieve their goals.” Lauding the increasing number of women in the field of Science she said

Billion Beats: Bringing Kalam's Ideas to Life

Mysuru: Through communication, we could bring in a revolution. To make that happen, we must begin the process at our homes and offices. Everyone around has a story to share. We need to capture them and *Billion Beats* would provide a platform to promote them said Dr. Anantha Krishnan M, Aerospace and Defence Freelance Journalist, while addressing the Children's Science Congress as part of 103rd Indian Science Congress, at University of Mysore, Mysuru. *Billion Beats* a digital initiative of former President Late AP J Abdul Kalam has the aim to take his mission close to people where inspirations are drawn from unsung heroes.

Billion Beats is being published by Inspired Indian Foundation, Bengaluru. It is currently edited by Dr Anantha Krishnan. Dr Kalam once said: learning gives creativity, creativity gives thinking, thinking provides knowledge and knowledge makes you great. *Billion Beats* is striving hard to create powerhouse of knowledge among young India.

The cancer

Continued from p.1....

he said that “in healthcare, newer perspectives of genomic backgrounds, different expressions of genes due to epigenetic regulators and distinct metabolic outcomes are gaining importance. The approach to treat cancer is more meaningful now than ever before”.

“We have tried seeking an answer in past decade and a half to unravel the complex nature of cancer by studying the genes. Sporadic breast cancer unlike familial breast cancer does not have genes implicated for its etiology” he said while pointing out to the deadly killer disease like breast cancer.

Prof. Sathees C. Raghavan, Department of Biochemistry, Indian Institute of Science, Bengaluru while speaking on cancer research said that “Leukaemia and lymphomas constitute 8-10 % of the total cancer cases reported around the globe. These are characterized by the presence of specific chromosomal translocations that act as genetic markers for diagnosis”. He added that, besides endogenous mechanisms, exogenous factors can also result in genomic instability.

Light has inspired

Continued from p.1....

Prof. Heroche remarked that Theory of Relativity as the turning point in the field of Science. Speaking on another milestone in the history of science, the invention of Laser, which also was one of Einstein’s ideas, he said laser gave a new application of light. He stressed importance of basic research for novel technologies and said that time and trust are the two components that will make a research’s value known.

Invest in Scientific Research and Development in India: Prof David J. Gross

-Shivendra G Urs

Mysuru: India should invest more in science and technology like China which has considerably increased investment in scientific research suggested Prof David Gross, the Nobel laureate from USA addressing scientists at 103rd Indian Science Congress in University of Mysore, Mysuru.



Prof David Gross, the Nobel laureate from USA addressing scientists at 103rd Indian Science Congress in University of Mysore, Mysuru.

Photo-Shreyas Devanoor

Comparing the rate of investment between India and china when it comes to investments in research and development he said both India and china had invested 0.8% of their GDP’s in 2000 but china doubled its investment in 2010 to 1.8% while India is still stuck at 0.8% and only in the year 2014 did it increased to 0.9% Prof. Gross said.

Lamenting on the dearth of funds given to scientific research in India Prof.Gross called upon governments to have political commitment towards science to bring about advancement in science. Promises made by heads of state in international forums like Indian Science Congress should be honoured in order to promote science and develop scientific temper in the country.

Terming rigid Indian bureaucratic system as unfortunate, Prof.Gross said, that it is one of the major bottlenecks for advancement of science in India. Reform in governance will give impetus to scientific discoveries and inventions in India, he added.

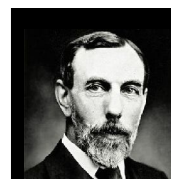
Highlighting the importance of basic science Prof. Gross said that, in India technology-driven science is most popular

among politicians and thus basic science is not given enough attention. It is because of this very reason Prof. Gross changed his topic from, ‘the frontiers of fundamental physics,’ to ‘importance of basic science,’ realizing the fact that the latter one served India better. This was also emphasized earlier by Nobel

Laureate Prof. Haroche Sarge.

Stressing the importance of research and development, Prof. Gross said, India has brilliant minds but those brilliant minds are migrating to USA and European countries for lack of appropriate opportunities in India, he suggested. Bring in reform and create suitable opportunities to reverse the scientists’ brain drain. Expressing concern over prioritizing application science over basic science, the Nobel Laureate cautioned that, India will lose brilliant minds to other countries if basic science is not backed to motivate excellence.

Prof.Gross improvised Prime Minister Narendra Modi’s vision of make in India by saying, invent, discover and make in India.



Progress is made by trial and failure; the failures are generally a hundred times more numerous than the successes ; yet

they are usually left unchronicled.

William Ramsay , Mhemist

Cancer Immunotherapy have Evolved: George Weiner

-Shrithi Joyappa K

Mysuru: Cancer immunotherapy has evolved through ages. Understanding the mechanisms by which tumors respond to immune recognition and attack is essential to developing new immunotherapeutic approaches including new agents and rationally designed combinations, said Dr. George Weiner, an Oncologist, from the University of Iowa addressing Plenary talk at 103rd Indian Science Congress hosted by the University of Mysore, Mysuru.

Prof. Weiner said that activating the immune system for therapeutic benefit in cancer has long been a goal in immunology and oncology. After decades of disappointment, the tide has finally changed due to the success of recent proof-of-concept clinical trials, he added.

Dispelling misconceptions about cancer therapy, he assured that continuous persistence in the research laboratory and translation of an improved understanding of the immune response to clinical



Dr. George Weiner, USA, addresses on the topic "cancer immunotherapy comes of age" as part of 103rd Indian Science Congress at B M Shree Hall, University of Mysore, Mysore

Photo-Nalini B

antigen receptors are showing particular promise. We are only now learning how best to use these new treatment modalities he said.

Progress in cancer immunotherapy is accelerating and ongoing preclinical and clinical research is sure to lead to new advances in the years ahead, he added.

trials have led to remarkable cancer immunotherapy successes in recent years. These advances rely on the specificity of the adaptive immune system as well as the cytotoxic potential of immune effector mechanisms, he pointed out.

Drawing attention to advance in cancer treatment, Prof. Weiner said that Immunotherapy strategies now have an impact on patients including anti-tumor monoclonal antibodies, antibody-drug conjugates, antibodies that block immune inhibitory pathways and T cells that have been modified to express anti-tumor chimeric

antigen receptors are showing particular promise. We are only now learning how best to use these new treatment modalities he said.

Progress in cancer immunotherapy is accelerating and ongoing preclinical and clinical research is sure to lead to new advances in the years ahead, he added.

Integrate Bio Diversity with Development of Smart Cities

-Shivendra G Urs

Mysuru: It is important for smart cities to be developed with herbaria plants and maintaining a database of the plants will educate and inform the citizens said Prof. Sudarshan Kumar, Senior Principal Scientist and Head Bio-informatics Division, National Botanical Research Institute, Lucknow while speaking on 'Biodiversity Database Integration for the Benefit of Human Kind'. Bringing out the importance of planting the *Neem* tree he said, "50% of *Neem* is cultivated in Uttar Pradesh alone and 1 lakh trees have been counted, we need to plant *Neem* across the country to produce *Neem* based products which have high demand in the global market".

Citing the example of China he said "China is the number one exporter of *Neem* in the world and added that, a whole province in China started to cultivate *Neem*. He added that, we need emulate China in popularising and growing more *Neem* trees in India. He

reiterated the linkage between the plant scientists and development of smart cities to restore biodiversity of smart cities.

Dr. G.P.S Bhargava speaking on 'genomics database on genome diversity and their application in designing personalized medicine' said that it is not necessary to use the similar drugs while treating patients suffering from the same disease as similar drug reacts differently among different people. Speaking about the importance of genome based medicine he said only four chemicals make the human genome system and annotating the genome is the biggest challenge faced by scientists. Expressing concern about the challenges of maintaining databases he called upon to develop and maintain them as in 5 years from now more than 50% of the database will become useless as no one is serious about maintaining them. Dr R.C Agarwal, the Registrar General of protection of plant varieties and farmers said that nutrition in the world

is supplied by a mere 30 plant species as they provide 95% of dietary energy and protein. Speaking about database and their legal provisions he said in India there is a strong need for developing a data sharing policy related to biodiversity and plant generic resources.

Dr. Anil Rai from the Centre for Agricultural Bioinformatics said that Marker Assisted genomic Selection (MAS) is cost effective, results in accurate production, high production of food for nutritional security as compared to traditional breeding programme. He said they have been cultivating only 150 crops out of 700 species and a large number of crops remain unused. He revealed that, ASHOKA, a super computing system has been developed by Centre for Agricultural Bioinformatics which provides free access to do research in agriculture sciences which includes data to predict the breeding level of plant and animal based genomes.

Radiation Technology Can Help Boost Quality and Quantity of the Produce say Experts

-Shivendra G Urs

Mysuru: Radiation technology aids and impacts quality and quantity improvement of the produce said Dr.S.F. D'souza, Associate Director, BMG, BARC, Mumbai while speaking on Atomic Energy at 103rd Indian Science Congress organised by University of Mysore, Mysuru. He emphasized on the positive impact of radiation use and nuclear power and pointed out that nuclear technology can be used for water security, agriculture and food processing. Stressing the importance of radiation technology in agriculture and food processing he said that, there is a need to produce more with the limited resources at hand and Radiation technology helps in improving both the quantity and quality of agricultural produce.

Stressing on the importance of radiation technology in developing disease resistance among plants, Dr.D'souza said mutants for respective crops have been developed to combat climate change

which are drought tolerant. Citing the example of TAG-25, a *Trombay Groundnut* variety which has been developed by using the technology, he revealed that it has high disease resistance and gives high yield when compared with the normal groundnut seeds. "A farmer can expect high yields of over 9 tonnes per hectare using the TAG-25 groundnut seeds" he added. Illustrating the significance of radiation, he observed that it has been a true boon in preventing food infestation, delaying the process of ripening and increasing the shelf life of the products. He strongly emphasised the positive role of technology in meeting the food demands of the growing population not just in India but of the world.

Dr. K.B Sainis, Director, Bio-Medical Group, BARC, Mumbai, while speaking on the benefits of ionising radiations on human health observed that the perception of radiation has been negative. He said that there are two types

of radiations, good and bad radiations and it is necessary to make people aware of them. Revealing the benefits of Nuclear Medicine he said, that it is a new field in medical science and has immense potential to address a lot of health problems but the stigma attached to radiation exposure is hampering its growth he observed.

Dr P.K Tewari speaking on the salient features of Nuclear technology for water security said that nuclear power plant has got capabilities to produce desalinated water from sea using waste heat from the nuclear plant. He informed that its applications has been set in motion by showing a prototype bicycle mounted purification which has been developed to Prime Minister Narendra Modi to get recognition of scientific experiments. Stating water as the core issue of national development, he assured that villagers will have access to safe drinking water with the help of this machine.

Modification in Diet can Prevent Cancer: Dr. Lokeshwar

-Nalini B.

Mysuru: Consumption of heavy meat and low plant based diet, low fiber and high salt diet, food additives, processed, heavy cooked (charred meat) and vitamin D, B2, B3 deficiencies are some of the causative factors of cancer and modification in diet can help prevent malignant cancer, revealed Dr. Balakrishna L Lokeshwar, Professor of Urology at University of Miami in the plenary session of 103rd Indian Science Congress at University of Mysore, Mysuru.

Prof. Lokeshwar said that there are various ingredients in spices that have the potential to prevent cancer. *Epicatechin* in green tea, *Genistein* in soy, *Resveratrol* in grape, *Catechin* in cocoa and *Curcumin* in curcuma ,



Dr. Balakrishna L Lokeshwar from University of Miami, addressing the gathering 103rd Indian Science Congress at University of Mysore, Mysuru

Photo-Nalini B

Pimentadioica, commonly known as Jamaican pepper, consumed extensively in various cuisines across the world are some of the cancer preventing ingredients that are widely available in spices that surround us, he said. Drawing attention

to the Cancerous cells that have more androgen receptors while compared to normal cells, he said that defeating these androgen receptors in prostate cancer delays the growth of the tumor .

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ಬೆಂಗಳೂರು - ಕರ್ನಾಟಕ ರಾಜ್ಯದ ಅಭಿಮಾನಿಗಳು.

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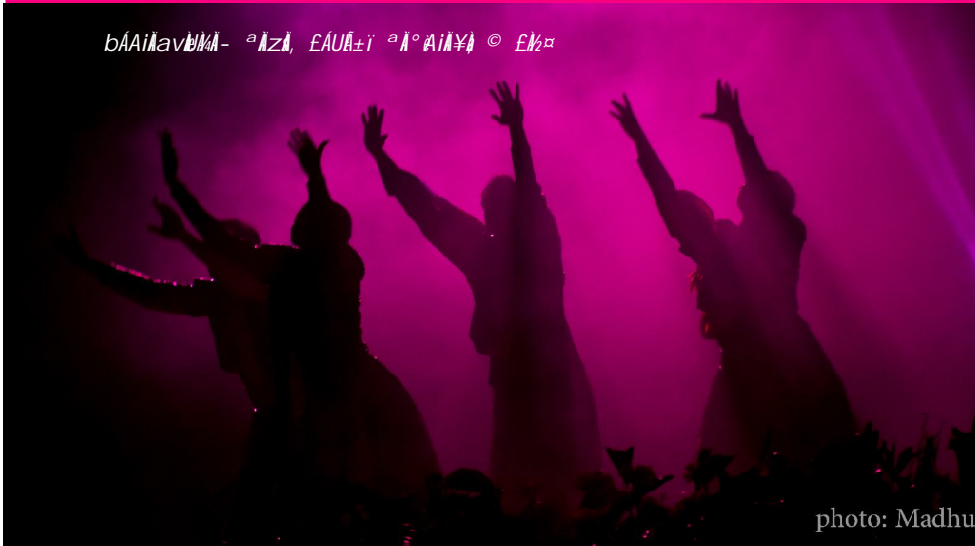


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