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Ask the right questions, and nature will open the door to her secrets.
- Dr. C.V. Raman, The Nobel Prize in Physics 1930

Study sheds light on the effect of microplastics

A study conducted by Periyar University and National Centre for Polar and Ocean Research (NCPOR) at the Silver Beach. The result of the study suggests that untreated urban sewage, tourism and fishing activities are sources of the plastic debris and storm-water runoff plays a significant role in the transportation of plastic debris through the Gadilam river and wave-induced deposition through high tides.

Study on Potassium deficiency in rice

A new study by a team of scientists at the Department of Biotechnology's New Delhi-based National Institute of Plant Genome Research (DBT-NIPGR) found that overexpression of a gene called OsJAZ9 helped make rice plants more tolerant of Potassium deficiency. Potassium-deprived rice had an enhanced accumulation of Jasmonate (JA)-Ile, which then activates potassium transporters for its uptake from the media.

IITians develop nano-coated magnesium alloys to repair bones

Researchers from the Indian Institute of Technology Madras (IIT Madras) have developed nano-coated magnesium alloys that can repair bone defects in rabbits and possibly other animals. The researchers coated the AZ31 alloy of magnesium with polycaprolactone (PCL) and nano-hydroxyapatite (nHA) by dipping and electrospinning, in order to avoid the fast degradation of magnesium and match the growth of new bones in rabbit femur, thus showing good recovery in rabbits without any adverse reactions such as fibrosis.

IARI scientists develop new method to solve stubble burning

Scientists at Indian Agriculture Research Institute (IARI) have developed PUSA Decomposer, which are in the form of capsules made by extracting fungi strains. Despite costing a mere INR 300 per acre to employ the method, the organic matter improves the quality of the soil as well.

Shanti Swarup Bhatnagar Prize for Science and Technology 2020

The Shanti Swarup Bhatnagar Prize is given to Indian scientists upto the age of 45 years for notable and outstanding research, applied or fundamental, in the following disciplines: (i) Biological Sciences, (ii) Chemical Sciences, (iii) Earth, Atmosphere, Ocean and Planetary Sciences, (iv) Engineering Sciences, (v) Mathematical Sciences, (vi) Medical Sciences and (vii) Physical Sciences. The award is named after the founder Director of the Council of Scientific & Industrial Research (CSIR) India, the late Dr (Sir) Shanti Swarup Bhatnagar. The names of the recipients are made public on 26 September.

The awardees for 2020 are as follows: For Biological Sciences, Dr Shubhadeep Chaterjee from the Centre for DNA Fingerprinting and Diagnostics and Dr Vatsala Thirumalai at the National Centre for Biological Sciences were awarded. Dr Chaterjee's work focuses on mechanisms that promote or suppress bacterial disease in plants. Dr Thirumalai works on neural circuits that control movement during development and adulthood in animals. In the field of Chemical Sciences, Dr Jyotirmayee Dash from Indian Association for the Cultivation of Science and Dr Subi Jacob George from Jawaharlal Nehru Centre for Advanced Scientific Research were named recipients. Dr Dash's team works on new methodologies for synthesis of diverse molecules that can be used to study structure and function of therapeutic targets. Dr George is an organic chemist who works on supermolecular synthesis. For Earth, Atmosphere, Ocean and Planetary Sciences, Dr Abhijit Mukherjee from Indian Institute of Technology Kharagpur and Dr Suryendu Dutta from Indian Institute of Technology Bombay were named recipients. Dr Mukherjee is a geology professor and works on the exploration of groundwater as a sustainable drinking water source. Dr Dutta works in the department of earth sciences and focusses on shale gas potential studies and higher plant biomarkers in sediments and crude oils. For Engineering Sciences, Dr Amol Arvindrao Kulkarni from CSIR National Chemical Laboratory and Dr Kinshuk Dasgupta from Bhabha Atomic Research Centre were awarded. Dr Kulkarni's research focusses on developing multiphase reactors and microreactors. For Mathematical Sciences, Dr Rajat Subhra Hazra from Indian Statistical Institute and Dr U K Anandavardhanan from Indian Institute of Technology-Bombay were awarded. For Medical Sciences, Dr Bushra Ateeq from Indian Institute of Technology Kanpur and Dr Ritesh Agarwal from the Postgraduate Institute of Medical Education and Research Chandigarh received the award. Dr Ateeq's research focusses on cancer biomarkers and molecular events that lead to progression in prostate and breast cancer. Dr Agarwal is a professor of pulmonary medicine and his main research area is a fungal infection called Allergic bronchopulmonary aspergillosis. For physical sciences, the award went to Dr Rajesh Ganapathy from Jawaharlal Nehru Centre for Advanced Scientific Research and Dr Surajit Dhara from University of Hyderabad.

Team lead by Indian scientists finds X-rays around black holes

A team of international scientists, led by those from India, has found a distinctive signature of cosmic X-rays to identify the boundary around black holes. According to Tata Institute of Fundamental Research (TIFR) in Mumbai, the current discovery is by far the strongest steady signature of the smaller, but more extreme stellar-mass black holes to date. According to the study, accepted for publication in the journal Monthly Notices of the Royal Astronomical Society, understanding stellar-mass black holes, which have masses about ten times that of the Sun, is indispensable to probe some of the extreme aspects of the cosmos. In order to prove the existence of these stellar-mass black holes, the researchers said these need to be distinguished from neutron stars which are the densest known objects in the universe with a hard surface. In the current study, the scientists analysed archival data from the now decommissioned astronomy satellite Rossi X-Ray Timing Explorer, and have identified the effect of the lack of hard surface in black holes on their observed X-ray emission. From this analyses, they have found an extremely strong signature of accreting stellar-mass black holes.