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# INDIA SCIENCE AND INNOVATION WEEKLY

*Ask the right questions, and nature will open the door to her secrets*

*- Dr. C.V. Raman, The Nobel Prize in Physics 1930*

## IITians develop tech to combat harmful radiation from DG sets

Group of researchers from the Indian Institute of Technology Delhi (IIT Delhi) has developed a technology, named 'Chakr Shield' to reduce 80% of the harmful exhaust fume emitted from the Diesel Generators (DG) sets, while saving about 1260 billion litres of air per day and 378 kg of Particulate Matter (PM) per year from getting polluted. The Retrofit Emission Control Device converts hydrocarbons to carbon-di-oxide, which is 460 times less harmful than PM 2.5 and PM 10.

## Indian researchers fine-tune method to safely use Docetaxel

Group of scientists from the Regional Centre of Biotechnology (Haryana), Amity University (Haryana) and National Institute of Immunology (New Delhi), have fine-tuned a method, through nanotechnology, to safely use docetaxel, a highly toxic and non-water-soluble drug, which is used to treat breast cancer. Scientists used nanomicelles, a type of nanoparticle, that reduced drug excretion in Kidney and ultimately helped the drug to target the tumour and not other organs.

## DBT-NIAB takes up project to help upscale goat production

The Department of Biotechnology's Hyderabad-based National Institute of Animal Biotechnology (DBT-NIAB) has taken up a project to upscale subsistence-level goat production for small farmers, who don't get enough returns from agriculture. The project will seek to transfer knowledge on economical methods to make feed stocks from locally available dry fodder; promote efficient micronutrient delivery methodologies; and improve roughage digestibility by supplementing cellulase.

## Mahalanobis distance

The Mahalanobis distance (MD) is the distance between two points in multivariate space. PC Mahalanobis, who founded the statistical measure, has been considered the father of modern statistics in India.

## Air India introduces robotic tech to disinfect aircraft interiors

Air India has introduced an effective device to clean and disinfect the interior of its aircraft, using ultraviolet C radiation with wavelengths between 200 and 280 nanometres, at the Delhi airport and plans to extend this technology across its other bases in the country. This technology is tested and approved by the National Accreditation Board for Testing and Calibration Laboratories for its efficiency to disinfect surfaces from microbes.

## IITians uncover new approach to inhibit Zika virus replication

Researchers at the Indian Institute of Technology-Indore (IIT-Indore) identify some structures in the genetic makeup of the Zika virus, that could be used as targets for drugs, in an effort to reduce the spread of the mosquito-borne virus in around 86 countries. A recent study by a team of scientists from IIT Indore have identified specific secondary structure called G-quadruplexes (GQ) in the Ribonucleic acid (RNA) of the virus that could act as binding sites for anti-cancer treatment. In association with a research group from the University of Nebraska-Lincoln, USA, the team has treated cells infected with the virus and found a significant decrease in the viral replication and in the viral growth.

## IITians find new clues to how and why stars die

IIT Guwahati researchers, in collaboration with researchers from Max Planck Institute for Physics, Munich, Germany, and Northwestern University, USA, have revealed important clues to understand the death of massive stars and have also revealed the problems with the existing models, that showed that two flavors of neutrinos instead of three species of neutrinos, are important. Supernovae are the only natural source where neutrinos and antineutrinos of all three species (electron, mu and tau 'flavors') are produced in substantial amounts. The new supernova simulations have shown the presence of muons in the supernovae, which in turn produce asymmetry between muon neutrinos and antineutrinos, taken to be zero otherwise, implying three flavor effects. Three flavor studies of neutrinos during core-collapse supernova explosions are essential as the fast oscillations of different neutrino particles may actually influence the solution to the question, i.e., why and how some massive stars die as supernovae and some don't.

## Special Update: National Institute of Science Communication and Policy Research (CSIR – NIScPR)

A new institute, named CSIR-National Institute of Science Communication and Policy Research (CSIR – NIScPR), has been formed after the merging of CSIR- National Institute of Science Communication and Information Resources (NISCAIR) and CSIR-National Institute of Science, Technology and Development Studies (NISTADS), in a step aimed at further strengthening science communication. The CSIR-National Institute of Science Communication and Information Resources (CSIR-NISCAIR) manages the largest and oldest National Science Library and also distributes International Standard Serial Number (ISSN), while CSIR-National Institute of Science, Technology and Development Studies (CSIR- NISTADS) has earned its reputation in its long journey in policy research and has a rich research experience in the area of History of Science, Science and Technology, and Society.

Further details can be found at:

<https://www.niscair.res.in/>