



Embassy of India, Berne 01 February 2021

# 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*

## IIT Researchers shed light on fog and haze incidence in Delhi

Researchers from the Indian Institute of Technology Madras (IIT-Madras) have found Chloride to be the highest inorganic fraction in particulate matter (PM 2.5), primarily responsible for haze and fog formation in Northern India including the National capital Delhi. Hydrochloric acid (HCl), emitted in the atmosphere from plastic contained waste burning, combines with ammonia, thus forming ammonium chloride (NH<sub>4</sub>Cl), which condenses to aerosol and exponentially increases the water uptake ability of aerosol particles resulting in increased size, eventually leading to dense fog formation.

## CSIR-NPL researchers develop security ink for bank cheques

Group of researchers from the Council of Scientific and Industrial Research-National Physical Laboratory (CSIR-NPL) have formulated a high-security anti-counterfeiting ink by synthesizing a pigment having phosphorescence, luminescent as well as magnetic properties in it. They synthesized a compound pigment that emits intense orange (580 nm wavelength) and red (660 nm wavelength) when put under ultraviolet (UV) light of 351 and 980 nm wavelength, respectively.

## IITian find new sample method for real-world datasets

Indian Institute of Technology (IIT) Mandi Researcher has proposed sampling techniques to accurately provide insight into the real world high dimensional datasets from various sources such as Internet of Things (IoT), bioinformatics, finance, social network etc. The researcher has proposed efficient and accurate sampling algorithms which finds close to optimal principal components even when outliers are present in the datasets.

## Kosambi map function

Damodar Dharmananda Kosambi was a celebrated mathematician with two important contributions; one was the Kosambi map function, and the other was the widely used statistical technique called proper orthogonal decomposition (POD). Both these techniques are used in image and signal processing, oceanography etc.

## CSIR-NIL and IISER to study immunity to COVID-19 post-vaccination

The CSIR-National Chemical Laboratory (NCL) and the Indian Institute of Science Education and Research (IISER) are likely to study the immune response to Covid-19 vaccination by measuring the concentration of antibodies in a section of inoculated healthcare workers in Pune. Since both Covishield and Covaxin are being deployed at the moment, there is a need to track the impact of the vaccine on the immune system after one or two doses of it, including the types and amounts of pathogen-specific antibodies by B cells, produced by the vaccine. The aim is to test at least 500-1,000 volunteers from multiple groups of individuals covering all ages with and without underlying illnesses, in order for the test to be statistically significant. The results will be useful to strategize large-scale vaccination, thereby bringing back normalcy in life.

## DRDO Scientists successfully test Atmanirbhar missile technology

The surface-to-air missile Akash-New Generation (NG) was tested successfully by Defence Research and Development Organisation (DRDO) for the first time off the Odisha coast. Akash-NG missile has been designed to strike low radar cross-section aerial targets. It weighs only half of the existing Akash missile and requires fewer ground systems. The performance of the command and control systems, onboard avionics and aerodynamic configuration of the missile was successfully validated during the trial. The Akash-NG system has been developed with better deployability compared to other similar systems with canisterised launcher and much smaller ground system footprint. The existing Akash missile has a range of 25 km, while the upgraded variant (NG) can strike targets at a distance of 30 km. The missile, already in service in the Indian military, has an indigenous content of 96%.

## IITM researchers conduct study to gain better understanding of air pollution

Researchers at the Indian Institute of Tropical Meteorology (IITM, Pune) conducted a study to gain a better understanding of the complex role of air pollution on weather and climate by investigating the role of aerosol, cloud formation and their vertical distribution. In the study, the researchers tried to correlate the height of cumulus cloud base and the drop in air pollution in the lockdown. Cumulus clouds are mostly the clouds that are formed at an altitude of 1 to 3.3 km during pre-monsoon season. The microphysical properties of clouds are affected by the type of aerosols that act as Cloud Condensation Nuclei (CCN) modifying cloud albedo, lifetime, rain initiation and precipitation. CCN is a critical parameter determining the cloud drop number concentration as cloud formation depends on the availability of CCN. IITM Scientists observed a massive drop in anthropogenic aerosols over the Delhi region during this first Lockdown and as a result, the concentration of CCN at lower level decreased.

## Special Update: Centre for DNA Fingerprinting and Diagnostics

The Centre for DNA Fingerprinting and Diagnostics (CDFD) is an autonomous organization funded by the Department of Biotechnology (DBT), Ministry of Science and Technology, Government of India. CDFD receives funding also from other agencies on specific collaborative projects. The Centre is recognized by the University of Hyderabad for pursuing Ph.D. programme in Life Sciences. The centre is equipped with world class state-of-the-art instrumentation and computing infrastructure to facilitate working in frontier areas of research in Life Sciences.

Further details can be found at:

<http://www.cdfd.org.in/>