# India International Science Festival*

The fundamental duty as enshrined in the Indian constitution under article 51A (h) is 'It shall be the duty of every citizen of India to develop the scientific temper, humanism and the spirit of enquiry and reform'. The India International Science Festival (IISF) 2016, second in the series, is an effort to engrave scientific temper across the spectrum of society. The prime objective of IISF is to expose the fruits of science and technology to the masses, build strategies to develop scientific temper among the people with an aim to provide a platform to young Indian scientists across the globe for the exchange of knowledge and ideas. The event was inaugurated by Rajnath Singh, Union Home Minister and Harsh Vardhan, Union Minister for Science & Technology, Government of India (GoI). Singh strongly articulated Jan vignan (science for the masses) to append to the popular slogan of 'jai jawan, jai kisan, jai vigyan'. Harsh Vardhan highlighted the capability of exporting India's R&D on earth sciences and weather forecasting to around 30 countries and reversing the trend from brain drain to brain gain through various schemes of GoI. While the Indian Science Congress is a platform for professional research workers, science festivals deal with all sections of society: young children to scientists, NGOs to research organizations, industry to scientific film-making organizations in a festive mode to discuss scientific ideas and innovations.

There were four plenary sessions on the topics like agriculture, health, information technology (IT) and water by leaders in the respective fields. In the session on agriculture, A. K. Tripathi (Central Institute of Medicinal and Aromatic Plants) highlighted the respective roles of ICAR and CSIR in the field of agriculture. ICAR mostly deals with food crops, while CSIR deals with industrial interface and exclusively on the medicinal aspects of crops like mint, asparagus, curcuma, ashwagandha, etc. In the session on health, Soumya Swaminathan (ICMR) introduced causes of infection and discoveries of treatments for various diseases in India. Alok Dhawan (Indian Institute of Toxicology Research) highlighted the scientific path from Stone Age to Nano age. In the session on water, Pradeep Majumdar (Indian Institute of Science, Bengaluru) emphasized low efficiency of water use in agriculture, human-induced hydrologic change and various hydrological models in relation to climate change. In the session on IT, Vijay Bhaskar stressed on the role and potential of IT in transforming villages and cities in the country, starting from e-governance to e-wallet. He expects IT to contribute to GDP of more than 20%, surpassing the contribution from agriculture.

IISF 2016 consisted of seven major events, namely mega science, technology and industry expo, science village, young scientists meet, industry–academia interaction, international science film festival, NGOs conclave and DST-INSPIRE national-level camp.

Mega science, technology and industry expo: This showcased the outstanding achievements of science and technology by not only scientific institutions, but also start-ups. Around 2 lakh people from different walks of life visited the expo. In the start-up hall, a hydroelectric cell was displayed that generates electricity using nothing except a few drops of water. This panel can generate up to about a quarter ampere current at a little less than one volt. This device, more economical than the solar panel, may revolutionize the energy generation scenario. The major participants in the expo were ISRO, DRDO, ICMR, ICAR, Oil and Natural Gas Commission (ONGC), Gas Authority of India Limited (GAIL), Central Water Commission (CWC), Department of Biotechnology and various CSIR laboratories across the country.

Young scientists meet and Unnat Bharat: In young scientists meet, researchers displayed working models, posters, sketch on spectrum of topics like smart city, Swachh Bharat, Namami Gange, waste-to-wealth, etc. If necessity is the mother of invention, then innovation is the father of prosperity. As India is celebrating decade of innovation, Unnat Bharat is a platform to showcase innovations by the common man to cater to his needs with minimal resources. For instance, the low-cost Bullet Santi multipurpose agriculture machine is a three-wheel equipment designed by a farmer for various agricultural operations like ploughing, sowing, weeding, spraying and transportation.

Industry–academia interaction: According to the World Economic Forum, India ranks 43rd in terms of industry–academia interaction, compared with China (23), Japan (21), South Korea (12) and USA (1). Burgeoning population as well as large proportion of working-age people, require skill development and entrepreneurship to reap the benefits of demographic dividend by creating employment. It is high time to tap the latent power of academia to meet national challenges like Make in India, and Digital India complementing growth of industry. Battery-operated 'e-rickshaws', majority of which are imported, is a case in point. In spite of our capability to manufacture low-cost charging battery domestically, our industry is moving abroad for similar technology. This is a matter of concern, as mentioned by K. L. Chopra (IIT Kharagpur). He emphasized that there are only 17 incubators now in India in comparison to 600-plus in China and 50-plus in a smaller country like Israel. A fellowship similar in the line of Prime Minister's Fellowship can be created to give an edge to the Indian entrepreneur. According to experts, autonomy along with accountability is the need of the hour for scientific institutions, to face the current challenges of industry–academia interaction.

*A report on 'India International Science Festival 2016' which was held in CSIR-National Physical Laboratory, New Delhi from 7 to 11 December 2016 with the theme 'Science for the masses'. It was organized by the Ministry of Science and Technology and the Ministry of Earth Science in collaboration with Vijnana Bharati and supported by Indian Space Research Organization (ISRO), Defence Research and Development Organization (DRDO), Indian Council of Medical Research (ICMR), Dept of Atomic Energy (DAE), Indian Council of Agricultural Research (ICAR), University Grants Commission (UGC), Unnat Bharat Abhiyan and All India Council for Technical Education (AICTE).

Science village (mega student camp): The gloomy state of rural schools is highlighted every year when Pratham (a NGO working on quality education) releases its Annual Status of School Education Report (ASER), which reflects lack of quality education in rural areas. Hence under this unique initiative, five students from classes IX to XI, and a teacher were nominated by members of parliament from the adopted village under Sansad Adarsh Gram Yojna. The students were exposed to interesting and thought-provoking hands-on science experiments on physics and chemistry, wherein they learnt practical aspects of the subjects. The programme relies on learning by doing and group activity. Around 1200 students from 25 states participated in the camp.

International science film festival: This seeks to promote science and attract talented young science film-makers. There were more than 80 entries from professional and student film categories, and a three-day workshop was held on using science films as a means to science communication and service to the nation. One such event is on 'Scientoons', which is an acronym for science and cartoon for science education and science communication.

DST-INSPIRE: As competitive examinations alone cannot identify the talent of youth, there is a dire need to do science that could excite and build critical human resource pool for strengthening the scientific base of the nation. Innovation in Science Pursuit for Inspired Research (INSPIRE) is an innovative programme sponsored by the Department of Science and Technology (DST) for attracting talent and seeding the joy of innovation in the age group of 10–15 years, i.e. 6th–12th standard students with Rs 5000 scholarship per child. After qualifying the district and state-level competition, 589 students across the country participated in the event. Sensitivity to societal concerns was reflected in the projects, such as devices for comfortably carrying head-load, safer railway crossings, etc.

NGO conclave: About 70% of people in India reside in rural areas. The Government lacks resources to reach every nook and corner of the country. Grassroots level presence of NGOs along with citizen-centric governance provide benefits to the remotest corner, thus making NGOs a natural partner of the government for development. This conclave was aimed to provide a platform for NGOs to develop a linkage among themselves, as well as with the research institutes, academia and policy makers for networking and exchange of ideas.

Thus, events like IISF can usher in a pivotal role for developing scientific temper among the masses. The ambitious efforts like Digital India, Make in India, Start up India and less cash economy can truly materialize only when science reaches the last mile which will strengthen the socio-economic fabrics of our country. The India International Science Festival is a dedicated effort in this direction.

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MEETING REPORT

# World Science Day*

On the occasion of UNESCO World Science Day for Peace and Development 2016, a day-long programme was jointly organized by CSIR-National Institute of Science Communication and Information Resources (NISCAIR) and United Schools Organization of India (USO). Many noted scientists interacted with school science teachers who participated in the programme.

Manoj Kumar Patairiya (CSIR-NISCAIR) pointed out that the teacher–student bond is a rather strong, time-tested and important one which not only educates but fosters interest in science in school children. However, the scientist–teacher and scientist–student bonds are either weak or non-existent, he added. He stated that at a time when students are getting weaned away from science, strengthening the scientist–teacher and scientist–student bonds can encourage students to pursue science. He also added that teachers can play a vital role in the scientist–student engagement and that such programmes were a suitable platform for the scientists and teachers to brainstorm on encouraging interactions among scientists, teachers and students.

A. K. Pandey (MP Private Universities Regulatory Commission) mentioned that it is essential to educate students about the many Indian contributions to science. He was of the view that teachers need to communicate about the pioneering contributions of great Indian scientists like Aryabhatta and others of ancient times. He said that highlighting the life and work of famous Indian scientists is generally neglected, and awareness of their contributions can inspire and develop confidence among youth. He also stated that the process of attracting students to science should be initiated from the early stages of schooling.

Narender K. Sehgal (Kalinga Prize winner) who chaired the panel discussion said that science teachers should carry out simple experiments in the schools which can enthuse the students. He said that teachers can be the early role models for students. Sehgal was of the view that conducive environment should be provided to the students which encourages them to ask questions and carry out experiments. He strongly supported the need for internalizing the method of science among youth.

Binod Kumar Tripathi (NCERT, New Delhi) delved on the National Curriculum

*A report on the day-long programme, 'Single Bond to Triple Bond: Encouraging Scientist–Teacher–Student Interaction' organized on the occasion of UNESCO World Science Day for Peace and Development 2016.