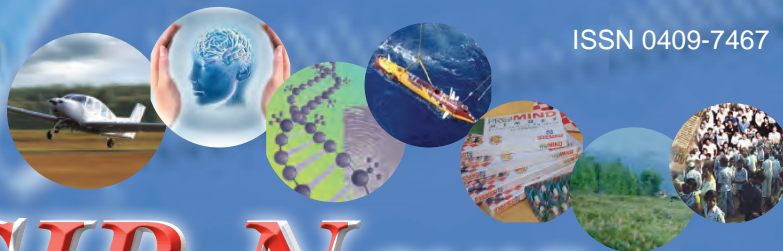




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# CSIR News

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January 2019

## In The News

# CSIR Bags Exhibitor of the Year Award

**CSIR** was adjudged as “Exhibitor of the Year” at the 106th Indian Science Congress — Pride of India (PoI) Mega Science Expo on the focal theme “Future India: Science & Technology” organised during 3-7 January 2019 at the Lovely Professional University (LPU), Phagwara, Punjab.

The five-day Mega Science Exhibition showcased cutting-edge technologies, leading scientific products and services, path-breaking R&D initiatives, schemes and achievements of

India’s foremost and leading public and private sectors, central and state government departments, research labs, educational institutions, corporate, defence, etc.

Latest technological advancements made in various sectors by CSIR, DRDO, ICMR, DST, MoES, GSI, DAE, ISRO, DBT, ICAR, etc. and other institutions, academic bodies, universities and other stakeholders associated with the education sector were exhibited at the PoI Expo.



## Biodiesel from Tung Oil

A semi-continuous type biodiesel plant has been designed, developed and tested at CSIR-CMERI. The plant with the capacity of 600 litres/day is able to produce biodiesel from any edible and non-edible vegetable oil irrespective of its FFA (Free Fatty Acids) content.

CSIR-CMERI (Central Mechanical Engineering Research Institute), Ludhiana station, has come up with a promising alternative to reduce the dependency on fossil fuels by designing and developing a biodiesel plant to convert vegetable into biodiesel.

*Aleurites fordii* (in India commonly referred to as a Tung tree) tree is spread widely in western China, Argentina, Paraguay, Africa, India and the United States. The tree usually bears fruit within 2–4 years and reaches maximum productivity at around 10–12 years of age. The productivity of Tung oil mainly varies from 300 to 450 kg/ha. The oil content of fruit is between 14–20%, in the kernel 53–60% and the in seed 30–40%. Tung oil has been used in different industrial applications such as ceramic, paint, paper and cloth production. More recently, Tung oil (*Aleurites fordii*) has been regarded as a promising non-edible source of biodiesel production.

A semi-continuous type biodiesel plant has been designed, developed and tested at CSIR-CMERI. The plant with the capacity of 600 litres/day is able to produce biodiesel from any edible and non-edible vegetable oil irrespective of

its FFA (Free Fatty Acids) content. This plant was utilised for making biodiesel based on optimised parameters to produce biodiesel from Tung seed oil.

In the northeast, mostly fire woods are used for cooking purpose which is very costly as well as causes tremendous environmental pollution. So, biogas can be a cheap, environment-friendly solution to cooking and power generation. Moreover, after anaerobic digestion, the spent slurry becomes an excellent organic manure which is highly rich in NPK content. This manure can be used in cultivation after drying.

Glycerol produced during the process of esterification as a by-product has market potential in soap and cosmetics industries. Moreover, the hull and husk of the seeds can be removed by dehuller and decorticator which can be fed into the gasifier to produce producer gas. Hence, every component of the chain contributes to energy generation. The present research, however, was focused only on the production of biodiesel from Tung seed.

In the northeastern part of India, a sufficient quantity of non-edible oil seeds like Tung is available having oil content ranging from 30 to 40%. The seeds can be extracted in an oil expeller. The extracted oil can be used to make biodiesel through transesterification. The biodiesel produced (calorific value of 9500–10500 kCal/kg) can be used to run engines and diesel gensets locally.

The leftover cake can be fed into the biogas plant. The biogas produced (calorific value of 5700 kCal/kg) can be used for cooking purpose or lighting purpose (directly or through generating electricity).



## A Solution to *Parali* Burning...

Delhi along with the National Capital Region (NCR) has been cited among the 20 most polluted cities in the world. Especially during the winter seasons, the air and smog pollution level reach almost 30 times more than the World Health Organization's (WHO) safe limits.

In Delhi, the major cause of the air and smog pollution is due to the burning of agricultural residues such as paddy/wheat straw and other agro-residues in the neighbouring states. In India, paddy crop has been cultivated in an area of about 43.95 million hectares producing about 106.54 million tonnes of edible rice and approximately 160 million tonnes of straw as residues. However, a large portion of the harvested agro-residues (~140 MT), known as *parali* in the larger area of north India, is burned in the field primarily to clear the field for farming activities for the cultivation of the next crop.

Punjab produced 11.27 million tonnes of rice, which is 10.6 per cent of the total rice cultivation/production in India during the year 2013-14. As a consequence, about 16.90 million tonnes of paddy straw was generated. During every season, about 35 million tonnes of paddy straw is burned in Punjab (55%) and Haryana (45%) especially during October to November. It is apparent that improper management and burning of agro-residues has created severe air and smog pollution in Delhi. There is, therefore, an urgent need for finding a solution to address this serious problem with techno-economic and socially acceptable prompt solutions.

A few initiatives such as anti-smoke gun spray, proposed to be used



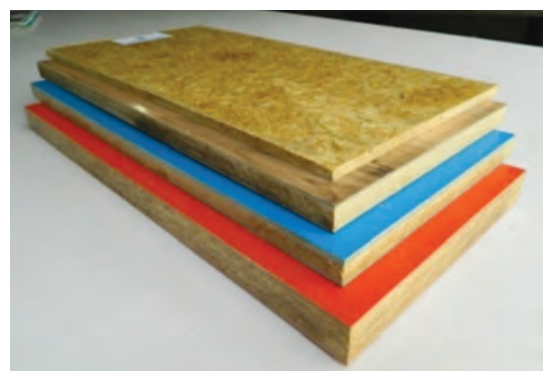
Source: [www.Outlookindia.com](http://www.Outlookindia.com)

in thermal power plants for electricity generation through pelletizing of agro-wastes, composting, biofuel, etc. has not been found effective enough to address this alarming challenge.

To provide a solution to reduce Delhi's smog pollution and stop burning of agro-waste *parali* in Delhi and neighbouring States (Haryana, Punjab and Uttar Pradesh) and converting them into useful materials, attempts have been made at the CSIR-Advanced Materials and Processes Research Institute (CSIR-AMPRI), Bhopal. The primary objective



Composite materials developed from paddy straw by CSIR-AMPRI Bhopal



Composite materials developed from wheat straw by CSIR-AMPRI Bhopal



Paddy straw



Paddy straw burned by farmers

The proposed research may address multiple issues with very well focused objectives like avoiding deforestation, utilising agro-wastes, developing termite free products, etc. for multifunctional applications in different sectors viz. housing interiors, civil infrastructure, etc.

is to develop a technology for utilising paddy and wheat straw as raw materials for “manufacturing hybrid greenwood”, which may be used as a substitute of wood or particle board.

We also aim to create a Centre of Excellence to act as an Incubation Centre for training and skill development among industry, entrepreneurs, startups, technicians and artisan for raw material characterisation, processing, synthesis and fabrication of composites, testing, validation of composites performance, process optimisation, pilot scale manufacturing and facilitating setting up of secondary industry for recycling and utilisation of paddy, wheat, maize straw and other agro-residues.

It is strongly expected that the

outcome of the applied research would lead to sustainable income for the local farmers and unemployed youth in that region and substantially provide solutions to issues associated with smokes and air pollution in the National Capital, New Delhi and the neighbouring states.

It is proposed to develop cost-effective wood substitute composite materials using paddy straw, wheat straw and maize straw and optimise the product manufacturing process for their use as an alternative of medium density board and other wood substitute materials. A clear business model may be planned for generating employment to local people and farmers for collecting raw straw residues, processing and engineers for manufacturing hybrid green composites and traders for sales and commercialisation and exploiting various applications of hybrid composites as wood, synthetic wood and medium density fibreboard.

The proposed research may address multiple issues with very well focused objectives like avoiding deforestation, utilising agro-wastes, developing termite free products, etc. for multifunctional applications in different sectors viz. housing interiors, civil infrastructure, etc.

A team of scientists of CSIR-AMPRI, Bhopal, visited the village Sunheri Khalsa, Thanser Taluk of Kurukshetra District in Haryana State and explored the possibility for recycling and utilising the paddy straw in manufacturing useful materials similar to that of particle board. During their visit, the paddy straw from Haryana was collected and quick preliminary feasibility experiments for converting

paddy crop residues into value-added products at CSIR-AMPRI, Bhopal, were conducted.

There is a possibility of converting agro-waste residues, especially the paddy, wheat and maize straw into commercially viable materials equivalent or better than that of commercially available synthetic wood such as particle board, plywood, etc. This envisaged unique programme also aims to contribute to the Government of India initiatives on Make in India, Clean India and Skill Development.

An Institute-Industry Interaction Meet on “Agro-Waste to Wealth” was organised at NIT (National Institute of Technology), Kurukshetra on 19 March 2018 for sustainable solutions and opportunities of R&D collaboration and entrepreneurship for utilisation of agro-wastes produced in Haryana, Punjab, Delhi & NCR. The event was jointly organised by NIT, Kurukshetra, Haryana and CSIR-AMPRI, Bhopal, in association with local officials, industries and farmers.



High-performance hybrid composite materials based on fly ash and natural fibre developed by CSIR-AMPRI Bhopal



Wood substitute hybrid composite materials based on fly ash/red mud/marble wastes reinforced with natural fibres developed by CSIR-AMPRI

*Asokan Pappu, M.K. Gupta, S.K.S. Rathore,  
A.K. Srivastava* (director@ampri.res.in)

CSIR-Advanced Materials and Processes Research Institute,  
Bhopal-462026, India

### MoUs/Agreements

## CSIR-IICT Joins hands with GCCI, Ahmedabad

Gujarat Chamber of Commerce and Industry in association with CSIR-Indian Institute of Chemical Technology (IICT), Hyderabad, organised an Industry Interactive Meet on 3 January 2019 to build a strong relation based on the needs of the industry and scientific & technical knowledge of the Institute. Seniors from CSIR-IICT and GCCI will

soon concretise the agreement so that Micro Small and Medium Enterprises (MSMEs) can access the technology of the Institute. This will involve technological research for MSMEs, Transfer of Technology (ToT) and solutions usually related to effluent treatments.

During the meet, Dr Jaimin Vasa,



Dr Jaimin Vasa, Chairman, GCCI and Dr S. Chandrasekhar, Director, CSIR-IICT  
(Image Credit: <http://www.gujaratchamber.org>)

Chairman, GCCI, said that through this joint initiative of CSIR-IICT & GCCI, they wish to create a platform for the chemical, pharmaceutical, agrochemical and environment industry leaders in and around Ahmedabad and facilitate sharing the expectations of the industry with the institution.

Dr S. Chandrasekhar, Director, CSIR-

IICT, Hyderabad, mentioned that the institute has the expertise and has large groups of scientists working in organic synthesis, catalysis, chemical engineering and environmental management. They work closely with industry in a complementary mode to enable them to become more competitive through the application of their R&D strengths.



(Image Credit: <http://www.gujaratchamber.org>)

## CSIR-CFTRI Signs MoU with JSS Science and Technology University



Image Credit: <http://jssstuniv.in>

CSIR-CFTRI (Central Food Technological Research Institute), Mysuru, signed a Memorandum of Understanding (MoU) with JSS Science and Technology University, Mysuru, to boost research work and help in researches on artificial intelligence, healthy food and machine learning. This would also be helpful in organising workshops, seminars and training programmes.

The MoU was signed in the presence of Shivarathri Deshikendra

Swamiji of Suttur Mutt 3 January 2019. According to the Vice Chancellor of the University, Dr B.G. Sangameshwara, new discoveries as well as advancements in research can be accomplished by the latest initiative.

Director, CSIR-CFTRI, Dr Raghavendra Rao mentioned that there is a huge potential for collaborative development and this will also have a beneficial impact on emerging industry requirements, society in general.

Director, CSIR-CFTRI, Dr Raghavendra Rao mentioned that there is a huge potential for collaborative development and this will also have a beneficial impact on emerging industry requirements, society in general.

### Events

## CSIR-NISCAIR Celebrates International Year of the Periodic Table 2019

Marking the 150th anniversary of the discovery of the Periodic Table, the UN General Assembly and UNESCO have

proclaimed 2019 as the “International Year of the Periodic Table of Chemical Elements”.



From L to R; Dr G Mahesh, Senior Principal Scientist, CSIR-NISCAIR; Dr Manoj Kumar Patariya, Director, CSIR-NISCAIR; Dr D.K. Aswal, Director, CSIR-NPL; Mr Mukesh Pund, Senior Principal Scientist, CSIR-NISCAIR

CSIR-NISCAIR joined the celebrations with the screening of a science film, “The Mystery of Matter: Unruly Elements” on 25 January 2019 at the Vigyan Suchna Bhavan, S.V. Marg, New Delhi.

The development of the Periodic Table of Chemical Elements is one of the most significant achievements of science and 2019 coincides with the 150th anniversary of the formulation of the Periodic Table by Dimitri Mendeleev

in 1869.

The film screening event was graced by Dr D.K. Aswal, Director, CSIR-National Physical Laboratory (NPL), New Delhi as the Chief Guest and Dr Manoj Kumar Patariya, Director, CSIR-NISCAIR, New Delhi, who Chaired the session.

Mr Mukesh Pund, Senior Principal Scientist, NISCAIR, gave the welcome address following which a brief introduction to the film was given by Dr G. Mahesh, Head, Information and Human Resources Division, CSIR-NISCAIR.

In his engaging talk, Dr D.K. Aswal began by piquing the curiosity of the audience by posing questions such as: Out of 118 elements in the Periodic Table, how many of them are naturally occurring? Can anything in the universe exist without an atom? How to make atoms? And so on. Thereafter,



Dr D.K. Aswal, Director, CSIR-NPL giving his lecture

he lucidly explained many scientific principles and concepts behind many of the elements.

The science documentary film, “The Mystery of Matter: Unruly Elements” is about various scientific events that happened during 1859-1902, from a young Russian chemistry professor named Dmitri Mendeleev who invented the Periodic Table of chemical elements to the young graduate Polish student Marie Sklodowska Curie who discovered radioactivity. The film screening as followed by an engaging session of interactions.

Dr Manoj Kumar Patairiya, in his

address, mentioned that there is no lack of talent among Indian students. He further emphasised the need to debate about one’s research among peers, so that knowledge sharing of new ideas and innovations can happen more effectively.

Mr Yatish Panwar, Senior Technical Officer, IHRD, proposed the vote of thanks.

The event was well attended by a wide range of audience, including students, educators, scientists, science communicators and science enthusiasts from various parts of Delhi.

*M.R. Raghu*



## CSIR-NISCAIR Organises “Jigyasa” — Harnessing Young Minds



“JIGYASA”, which is a wide-ranging scientist-student connect programme initiated by the association of CSIR (Council of Scientific and Industrial Research) and Kendriya Vidyalaya Sangathan (KVS), aims to connect school students with scientists for extending students’ classroom knowledge and experiences to laboratory-based hands-on learning.

As a part of this initiative, about 120 students from Kendriya Vidyalaya, Keshavpuram, accompanied by 10 teachers visited the CSIR-NISCAIR (National Institute of Science Communication and Information Resources) Pusa Campus, New Delhi, on 31 January 2019. With this, CSIR-NISCAIR kicked off its first “JIGYASA” programme for the year



Dr Sunita Garg, Emeritus Scientist, CSIR-NISCAIR explaining herbarium techniques to students and teachers

2019-2020. The one-day programme to inspire the students to come up with innovative ideas and motivate them for creative science provided an opportunity to visit various sections of the institute, including Climate Change, Raw Materials Herbarium and Museum, Multimedia Studio, Popular Science Division and Printing facility.

Students enjoyed their visit to the

Raw Materials Herbarium and Museum (RHM) which houses economically important raw materials of plant, animal and mineral origin from India at one place. Students came across over 8000 specimen of economic and medicinal plants of India in the Herbarium.

In Climate Change Informatics (CCI) section, students were briefed about the various tools and techniques



used in climate change studies. Students were also taken to the printing press where they observed how the research data in the form of files in computers get converted into magazines/journals.

Finally, students & teachers interacted with the scientists and technologists of the institute who are playing an important role in communicating science, bringing developments/advancements in science & technology to the society at large. During the programme, students were explained about the importance of science dissemination, communication and popularisation and how this helps our lives.



Eager students examining the raw material exhibits



Students at CSIR-NISCAIR as part of the Jigyasa programme

## CSIR-CBRI Organises Two-day Student-Scientist Connect Programme



Dignitaries and participants attending the programme

CSIR-Central Building Research Institute (CBRI), Roorkee, organised a two-day Student-Scientist Connect Programme during 24-25 January 2019, under Jigyasa.

The programme was inaugurated on 24 January 2019 to celebrate the National Girl Child Day 2019 and the first UN International Day of Education

with the aim to ensure inclusive and equitable quality education, empower the girl child and to promote lifelong learning opportunities for all. Dr Kulwant Singh, Scientist H, Department of Materials Sciences, the Bhabha Atomic Research Centre, Mumbai, graced the occasion as the Guest

of Honour and Dr A.K. Minocha, Chief Scientist, CSIR-CBRI, Roorkee, presided over the function.

Addressing the gathering, Dr Kulwant Singh encouraged the students and explained the importance of goals in life. He said that it is essential to set realistic, time-bound goals and work towards them with dedication to achieve success in any field. Laziness and procrastination cannot be a part of this journey. He asked the students to take failures in stride and consider them the stepping stones for brighter horizons.

Dr A.K. Minocha said that education is the basic right of every individual irrespective of class, creed, race, age, colour or gender and thus the Government of India runs various programmes for the fulfilment of this goal for its citizens.

During the technical session, Dr R.K. Goel, Scientist-in-charge, CSIR-CIMFR (Central Institute of Mining and Fuel Research Institute), Regional



Dr R.K. Goel delivering a lecture on "Tunnel Engineering"

Centre, Roorkee, presented a lecture on “Tunnel Engineering”, and explained about the diverse types of tunnels, their excavation process; equipment used, construction challenges and the key safety features during the process.



Second day inaugurated with a prayer session



Dr Suvir Singh, Chief Scientist, CSIR-CBRI, delivered a lecture on “Fire Engineering” and informed about fire safety and challenges in buildings, how to minimise loss and the latest structure element technologies such as fire-resistant glasses and thermal shock protected column, etc. developed for the prevention, protection and confinement of the fire.

In a lecture on “The Scientific Journey of CSIR & CBRI”, Dr Atul Kumar Agarwal, Senior Principal Scientist and Jigyasa Programme Coordinator, CSIR-CBRI, introduced the students to the research work being carried out by CSIR-CBRI, Roorkee, and its sister laboratories in every sphere of science. He asked the students to identify their passion, study the

research and technologies developed by CSIR in that field, take inspiration and bring forward their own ideas and projects for the development of new technologies paving the path to a New Innovative India.

The second day, Dr Kulwant Singh, Scientist H, BARC, Mumbai, gave a lecture on “Application of Nuclear Research in HumanService”, and talked about the technological contributions of the Bhabha Atomic Research Center to the society. He talked about works being



Dr Suvir Singh delivering a lecture on “Fire Engineering”



Dignitaries and participants attending the programme



Dr Atul Kumar Agarwal during his lecture



Dr Kulwant Singh delivering a lecture on "Application of Nuclear Research in Human Service"



Dr L.P. Singh delivering a lecture on "Nanotechnology"



Students visiting the laboratories of CSIR-CBRI, Roorkee

carried out by BARC in different science sectors for clean, eco-friendly, renewable resource, nuclear fusion, etc.

Dr L.P. Singh, Principal Scientist, CSIR-CBRI, delivered a lecture on "Nanotechnology" and informed about applications of nanotechnology in buildings, the use of nanotechnology to modulate concrete and optimise loading capability in buildings. Dr Singh informed that nanotechnology is being used to develop inexpensive yet advanced and sustainable technologies

to ensure the economic and social development of the country.

In a lecture on "Scientific Temper for Intellectual Development", Dr Atul Kumar Agarwal said that education should not be bound by books, instead should be gained through practical applications and structured thinking. Learning should have some purpose that inspires us to think creative ideas to fulfil our goals.

A Science Quiz Competition was also organised for the students during the programme. The students also visited the laboratories of the institute and interacted with the institute's scientists to expand their knowledge in all aspects of building construction including building materials, technology, fire engineering and disaster mitigation, etc..

In the valedictory session, Dr A.K. Minocha and Dr Kulwant Singh felicitated the winners of the Quiz Competition. The team of Apoorva and Anshuman from Kendriya Vidyalaya No. 1, placed first with a gold medal; team of Vachan Das and Saumya Agarwal from Adarsh Bal Niketan



Dignitaries during the valedictory session

placed second with a silver medal; team of Anuj and Utkarsh from Army Public School 2 placed third with a bronze medal; and team of Jainab Khan and Sanjana Gautam from Arya Kanya Pathshala Inter College were awarded the medal for the fourth position. Dr L.P. Singh proposed the vote of

thanks.

About 400 students from Arya Kanya Pathshala Inter College, Gandhi Mahila Shilp Vidyalaya Inter College, Kendriya Vidyalaya No. 1, Adarsh Bal Niketan and Army Public School 2, along with their teachers, participated in the programme.



Winners of the competitions with dignitaries

## CSIR-IITR Participates in Kisan Mela Held at CSIR-CIMAP



The CSIR-Indian Institute of Toxicology Research (CSIR-IITR), Lucknow, participated in the Kisan Mela-2019 organised by the CSIR-Central Institute of Medicinal and Aromatic Plants (CSIR-CIMAP) Lucknow, on 31 January 2019 at the CIMAP campus.

The event was inaugurated by former Director General of Indian Council of Agricultural Research (ICAR), Dr Mangala Rai. Over 3000 farmers from UP, Bihar, Punjab, Haryana, Madhya Pradesh, Gujarat, Rajasthan, Jharkhand, Chhatisgarh, Tamil Nadu and other

states attended the Kisan Mela.

The technologies developed by CSIR-IITR on safe water and food were displayed at the event, including “Oneer” – a water disinfection system, Argemone oil adulteration detection kit, Butter Yellow adulteration detection kit, etc. The team CSIR-IITR distributed informative brochures to the public for raising the awareness on safe food, safe water, women health, ill-effects of using plastic and environmental

safety issues. The aim for setting-up the stall was to communicate information and to spread awareness regarding health and the environment.

A fully functional unit of “Puraneer” commercialised by SS Maser Technologies Pvt. Ltd. which is based on the water disinfection technology developed by CSIR-IITR (Oneer) was installed at the event. It was one of the major attractions at the Kisan Mela. More than 2500 farmers consumed the water from Puraneer and gave extremely positive feedback.



## Lecture

# Dr K.P.S. Murthy Delivers the CSIR-NCL Foundation Day Lecture



Dr K.P.S. Murthy, Director, HEMRL, Pune, delivering the CSIR-NCL Foundation Day Lecture



Dr Sunil Joshi, Chair, Chemical Engineering and Process Development, CSIR-NCL felicitating Dr K.P.S. Murthy

CSIR-National Chemical Laboratory (CSIR-NCL), Pune, celebrated its 69th Foundation Day on 5 January 2019. As part of the celebration Dr K.P.S. Murthy, Director, High Energy Materials Research Laboratory (HEMRL), Pune, delivered the CSIR-NCL Foundation Day Lecture on 9 January 2019 on the topic “Research and Development Opportunities and Challenges in High Energy Materials”.

He talked about the importance of defence research explaining how defence research differs from other research and development. He said that “Defence research is not a profession; it is a service as you are no longer competing with your colleagues, you are competing with another nation.”

Defence research is teamwork where quality, repeatability, consistency and performance are more important; cost matters less. Dr Murthy said that defence research focuses on expanding the scientific knowledge and investigating new technologies to provide better

warfighting equipment. He said, “We need to anticipate technological needs for an uncertain future and establish relevant and feasible technologies to utilise in warfighting programmes.”

He explained the process of the development of any war system and how the entire project is designed. There are four basic parameters for the prioritised science and technology projects as adversarial threats, capability needs, customer requirements and available resources. He talked about the two aspects of the Research and Development being carried out normally, which includes the incremental R&D featuring the near-term benefits and the other is the disruptive R&D featuring the innovative technologies for long-term growth.

Dr Murthy mentioned the financial implications of the various phases of the research. The cost of the research is not much but when the technology matures, for the demonstration the cross-functional teams have to get

He said that “Defence research is not a profession; it is a service as you are no longer competing with your colleagues, you are competing with another nation.”

He highlighted the role of the Defence Research and Development Organisation (DRDO) and its collaborative goal to support the defence R&D programmes, especially in the areas of basic and applied research; to utilise the analytical and experimental knowledge in the development of prototypes; to share processing and testing facilities at DRDO and institutes and to build a strong knowledge base in selected areas ultimately reducing the overall development cost and time.

involved in its evaluation which is costly and time-consuming. He highlighted the role of the Defence Research and Development Organisation (DRDO) and its collaborative goal to support the defence R&D programmes, especially in the areas of basic and applied research; to utilise the analytical and experimental knowledge in the development of prototypes; to share processing and testing facilities at DRDO and institutes and to build a strong knowledge base in selected areas ultimately reducing the overall development cost and time.

Dr Murthy informed about the core competencies of HEMRL, Pune, that includes the synthesis, characterisation and evaluation of high energy materials and its in-house manufacture at Pilot Plant scale. He talked about the important contributions of the HEMRL. He reminded the vision and mission of the HEMRL. Different types of the

solid rocket propellants are developed in HEMRL including the extruded double-base propellants, cast double-base propellants, extruded composite propellants, fuel-rich propellants, advanced energetic propellants and composite propellants.

It has also developed various solid propellant technologies for propulsion systems of indigenous rockets and missiles. He further talked about the opportunities for R&D organisations that feature today's significant Information Technology and schemes such as Make in India and Skilled India.

Earlier, Dr Sunil Joshi, Chair, Chemical Engineering and Process Development, CSIR-NCL, gave the welcome remarks and introduced the speaker to the audience. Later, NCL Research Foundation Awards were also distributed to the CSIR-NCL staff at the hands of Dr Murthy.

### Honours & Awards

## Director, CSIR-NISCAIR, Receives Two Prestigious Awards

Dr Manoj Kumar Patariya, Director, CSIR-NISCAIR, was awarded the "Dr Hari Mohan Samman-2018" by the Bhartiya Hindi Parishad (Indian Hindi Council), Prayag, in its 44th Convention held at B.K. Birla College, Mumbai University on 7 December 2018. He received the award for excellence in promoting and communicating science through Hindi. The main aim of the Indian Hindi Council is to encourage study and research of all aspects of Hindi including literature, culture, etc. and to observe its progress in

particular.

Dr Patariya, who was the host of the 2010 PCST (Public Communication of Science and Technology) conference in New Delhi has also been honoured with the honorary life membership of the PCST network. PCST Network awards honorary life membership to individuals who make a distinguished contribution to the international science communication community.

A well accomplished scientist and science communicator, Dr Patariya has served as Adviser/Scientist 'G' in the



Dr Patairiya has conducted training programmes, created academic courses, established Centres for Science Communication and Science Archives, organised conferences, and started special programmes on Technology Communication, Risk Communication, Spirit of Innovation, International Cooperation, etc.

Department of Science & Technology, Govt of India, prior to his assignment in Prasar Bharati.

Dr Patairiya is decorated with prestigious national and international awards including Global Science Popularization Award by Centre for Global Studies, Houston, USA; Indira Gandhi National Award by Ministry of Home Affairs, Dr Atmaram Award by Ministry of Human Resource Development, Bhartendu Harischandra National Award by Ministry of Information & Broadcasting, Chaudhary Charan Singh National Award by Ministry of Agriculture & Farmers' Welfare, and Dr B.C. Deb Award by Indian Science Congress, etc. Many of these awards were conferred on him by the then Presidents of India Dr Shankar Dayal Sharma, Dr APJ Abdul Kalam, Mrs Pratibha Devi Singh Patil, and Vice

President of India Shri Bhairon Singh Sekhavat including a recent one by present President of India Shri Pranab Mukherjee.

Dr Patairiya has has conducted training programmes, created academic courses, established Centres for Science Communication and Science Archives, organised conferences, and started special programmes on Technology Communication, Risk Communication, Spirit of Innovation, International Cooperation, etc.

Dr Patairiya has authored books on biotechnology, environment, and science communication, and co-edited the widely acclaimed books – “Sharing Science” and “Science Meets Communication” – and has a large number of high standard research and popular science publications to his credit.

Nominations are Invited for

**Shanti Swarup Bhatnagar Prize**for  
**Science and Technology 2019**

The Council of Scientific and Industrial Research (CSIR) invites nominations for the Shanti Swarup Bhatnagar (SSB) Prizes in Science and Technology for the year 2019. The SSB Prizes are to be given for research contributions made primarily in India during the past five years. The age of the nominee for the SSB Prize 2019 should not be more than 45 years as on 31 December 2018.

The SSB Prizes are awarded for notable and outstanding research, applied or fundamental, in the following disciplines: (1) Biological Sciences, (2) Chemical Sciences, (3) Earth, Atmosphere, Ocean and Planetary Sciences, (4) Engineering Sciences, (5) Mathematical Sciences, (6) Medical Sciences and (7) Physical Sciences. The SSB Prize carries with it a citation, cash award and a plaque for each scientist selected for the award.

Nominations addressed to **Scientist Incharge-SSB YSA Unit**, Human Resource Development Group, CSIR Complex, Library Avenue, Pusa, New Delhi 110 012 should be sent as per the prescribed proforma (original + 2 copies) along with reprints of significant publications of the last 5 year's period on or before **31 March 2019**.

The Softcopy (in PDF format) of duly filled proforma, significant publications and photograph (in JPEG format) of the nominee is also required in a USB/Pen drive. The details of the SSB Prize and the prescribed proforma for nomination may be obtained from the above address or may also be downloaded from the **website: <http://csirhrdg.res.in>**

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Phone: 25848702; Fax: 25847062; E-mail: [csirnews@niscair.res.in](mailto:csirnews@niscair.res.in); [hjk@niscair.res.in](mailto:hjk@niscair.res.in)

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