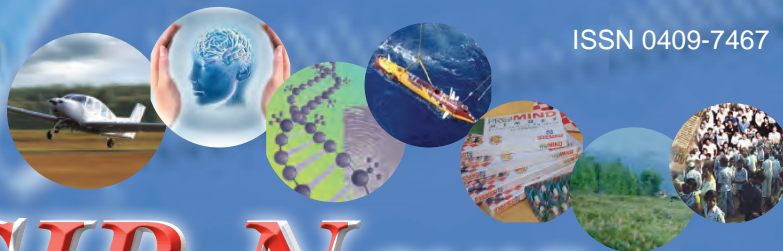




ISSN 0409-7467



CSIR News

NEWSLETTER OF THE COUNCIL OF SCIENTIFIC & INDUSTRIAL RESEARCH

Volume 69 No. 11 & 12

website: <http://www.csir.res.in>

June 2019

In The News

Contributions of S&T to World's Biggest Democratic Elections

“CSIR was the first organisation that contributed in the successful conduct of the election process,” says Dr Shekhar C. Mande, DG-CSIR



Dr Shekhar C. Mande, during his talk

ON 17 June 2019, CSIR organised a seminar on the “Contributions of S&T to World’s Biggest Democratic Elections” at CSIR-NPL (National Physical Laboratory), New Delhi. The seminar was graced by Dr Shekhar C. Mande, DG, CSIR, Secretary, DSIR; Dr Rajat Moona, Director, IIT, Bhilai & Member Technical Expert Committee EVMs; Prof. D.T. Shahani, Prof. Emeritus, IIT

Delhi & Chairman, Technical Expert Committee EVMs; Dr Rajeeva Karandikar, Director, Chennai Mathematical Institute & Member of Committee of EC on Sampling of VVPATs, and Dr D.K. Aswal, Director, CSIR-NPL.

In his opening remarks, Dr Mande said that CSIR has a long history in the implementation of technology in the field. He recalled the



From L to R: Ms Subhra Priyadarshini, Editor of *Nature India*; Dr Rajeeva Karandikar, Director, Chennai Mathematical Institute & Member of Committee of EC on Sampling of VVPATs; Prof. D.T. Shahani, Prof. Emeritus, IIT Delhi & Chairman, Technical Expert Committee EVMs; Dr Shekhar C. Mande, DG, CSIR, Secretary DSIR; Dr D.K. Aswal, Director, CSIR-NPL; Dr Rajat Moona, Director IIT, Bhilai & Member Technical Expert Committee EVMs

“Election is a mega extraordinary complex process and in fact, most people around the world find it difficult to believe that we are able to conduct such a process successfully without any major incidence, which is something remarkable,” said Dr Shekhar C. Mande.

contributions of CSIR towards nation building from the indelible ink to providing relief during the recent Fani Cyclone in Odisha. He said that various aspects of science and technology have played a major role in making elections in India successful.

“Election is a mega extraordinary complex process and in fact, most people around the world find it difficult to believe that we are able to conduct such a process successfully without any major incidence, which is something remarkable,” said Dr Shekhar C. Mande.

Dr D.K. Aswal, delivered his talk on “Indelible Ink: A Historic Contribution of CSIR” wherein he discussed the journey covering all aspects of indelible ink developed by CSIR-NPL. He informed that today also CSIR-NPL does a quality check of the ink manufactured by Mysore Paints for the Election Commission. In his presentation, he shared a fake post on Facebook regarding indelible ink showing how it was disappearing

after a wash. Clearing the doubt he explained that indelible ink is trustworthy because of the underlying science and regular testing by CSIR-NPL on random samples picked up by ECI. He further added that social media reports on failures are untrustworthy as the representations are unscientific.

Dr Aswal also discussed about the other type of inks from luminescent security ink for Indian currency to optically variable colour shift ink for the security of the nation developed by CSIR-NPL. He revealed that a new technology of invisible ink is also under process.

In his talk on “EVM: A Game Changer Technology for Indian Elections”, Dr Rajat Moona elaborated on the features and technicalities of EVMs which make them robust. Dr Moona said that EVM is a stand-alone machine as it is not available on any network or wirelessly. Therefore, there is no possibility of hacking. He also discussed many other

issues associated with EVMs and VVPATs.

Prof. D.T. Shahani gave his lecture on “VVPAT: An Innovative Zero Error Technology for Indian Elections” and presented the summary of EVM and VVPAT technical features. He also talked about the collaboration with different IITs which empowered error-free VVPATs to enhance voter confidence demonstrated with the recent election results. Dr Shahani

discussed how voting progressed over the years from ballot paper to electronic voting.

Dr Rajeeva Karandikar presented his lecture on “Role of Statistics in Electoral Process”. Ms Subhra Priyadarshini, Editor of *Nature India*, moderated the panel discussion and discussed the emerging technologies/developments which can boost the electoral process. The discussion was followed by an interactive session.



Launch of “JALDOST”, the Airboat for Flood Rescue & De-Weeding

Airboats use air propulsion and thrust vectoring technology to travel in shallow/flood waters. Because the propulsion system is in the air, there are no moving parts below the water surface and there is no risk of entanglement with objects under water which are not easily identifiable. This feature also makes it ideal for life saving & rescue operations in flood disaster situations. Directional control is achieved using vector thrust technology, by diverting the propeller downwash airflow, using twin metallic rudders made of aluminium skin and welded steel internal members.

Our country has a huge need for systems which are capable of travelling on weed infested water and marshy lands where conventional boats with submerged propellers are unusable. This capability can also be effectively used to remove weeds from lakes and other water bodies, for



efficient cleaning for environmental compliance.

On 1 June 2019, CSIR-NAL launched *Jaldost* at the Ulsoor Lake in central Bengaluru, which can be used for flood relief as well as for weeding in waterbodies. The boat uses stainless steel cutters which facilitates cutting of rooted weeds in water bodies. The system uses

hydraulic power from the engine to cut weeds and is also fitted with equipment to scoop them up.

The boat launched in the Ulsoor lake is a prototype and can accommodate one crew member and

three passengers.

The airboat was constructed using technology used in low-cost aircraft. *Jaldost* can travel in locations where conventional boats are not practicable.

“Kilo-lab” at CSIR-IICT to Boost Drug Manufacturing



Dr Shekhar C. Mande, DG, CSIR, inaugurating the, ‘Kilo-lab Facility’”

The kilo-lab aims at developing the highly-pure form of drugs/chemical synthesis which could be taken to the next level of clinical trials.

The Padma Bhushan Dr A.V. Rama Rao Kilo Lab, a fully sanitised high-tech laboratory at CSIR-Indian Institute of Chemical Technology (IICT), Hyderabad, was inaugurated on 17 May 2019 by Dr Shekhar C. Mande, DG, CSIR, during his visit to the institute. The Kilo Lab is the first such lab in a public institution which aims to boost drug research and production in a qualitative ambience without exposing scientists to toxics, in one go in a single lab. The facility would be available to startups and small and medium-scale

firms who want to avail the facilities of the lab.

The kilo-lab aims at developing the highly-pure form of drugs or chemical synthesis which could be taken to the next level of clinical trials. Earlier, it was not possible to complete all manufacturing steps in a single lab, hence maintaining the synthesis impurity free was also difficult and the process was time-consuming too. However, the Kilo Lab has solved the problem as drugs can be manufactured with purity in high quantity at one go.

CSIR-NCL Transfers Technology for Organic Farming



Prof. Ashwini Kumar Nangia, Director, CSIR-NCL and Dr Santosh Tupe, Executive Director, Greenvention Biotech after exchanging the agreement documents

CSIR-National Chemical Laboratory (CSIR-NCL), Pune, has signed a Technology Licensing Agreement with Greenvention Biotech Pvt. Ltd, Pune, for integrated pest and pathogen management in agriculture using fungi and their metabolites. Eco-Friendly, integrated pest management in agriculture approach has been developed at CSIR-NCL as a technology using microorganisms such as fungi and their products.

According to Dr M.V. Deshpande, Principal Investigator of the bio-control programme, CSIR-NCL, in view of recent deaths of farmers due to chemical insecticides, there is an increasing receptivity of farmers for eco-friendly microbes to control pests and pathogens. An eco-friendly, cost-effective, integrated

pest management is useful to the farmers having small land holdings and farmers who export agricultural produce that has no chemical residues.

Greenvention Biotech Pvt. Ltd is a start-up from Uruli-Kanchan (Pune) works on several agriculture related products. Prof. Ashwini Kumar Nangia, Director, CSIR-NCL and Dr Santosh Tupe, Executive Director, Greenvention Biotech signed the Technology Licensing Agreement.

Dr Subhash Chavan, Head, Organic Chemistry Division and Dr Mukund Deshpande, Dr Bhushan Chaudhari, Dr Ashok Giri from Biochemical Sciences Division, Mr G. Prabhakaran, Head Business Development were present on this occasion.

Eco-friendly, integrated pest management in agriculture approach has been developed at CSIR-NCL as a technology using microorganisms such as fungi and their products.

Eco-friendly Disintegration and Disinfection of POP from Biomedical Waste

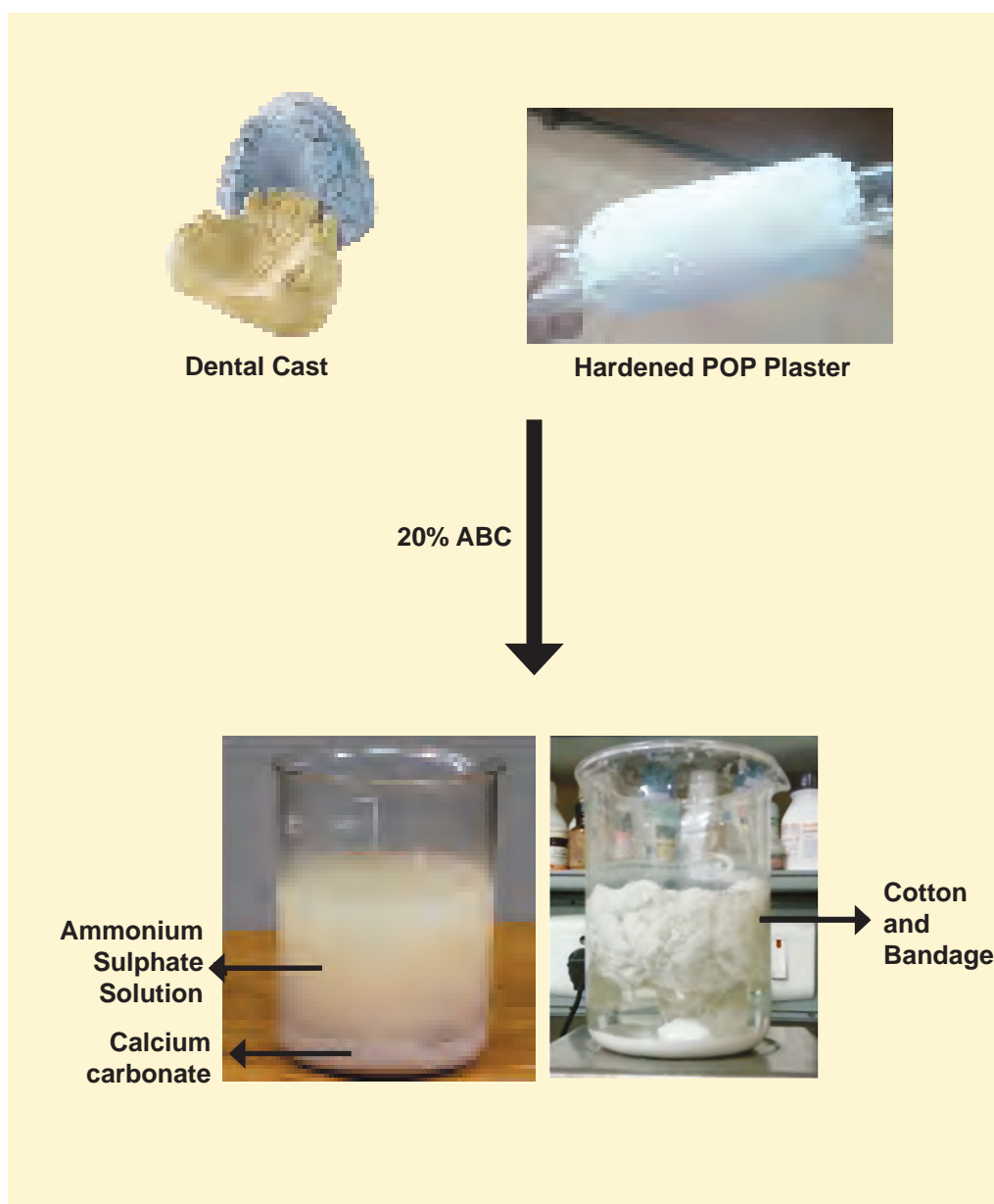
The antimicrobial and antibiofilm activity of ammonium bicarbonate has been documented in disinfection microbiology, which also revealed that it can also disinfect the POP waste generated from patient samples

Plaster of Paris (POP) is being used in Healthcare (Orthopaedics and Dentistry) sector for various uses. The plaster casts are made out of POP for the immobilization of broken bones while it heals and for surgical bandages. In dentistry, POP is used for mounting casts or models of oral tissues. Generally, around 7-8kg/day POP plaster waste is generated by Dental and Orthopaedic hospitals. Such hazardous waste containing various microbial loads is collected by local Municipal bodies and burnt in open spaces or incinerated at high temperature or left as it is for decomposition.

The burning of this waste emits toxic gases and heavy metals into the environment. It bears some cost in addition. The POP waste from such biomedical origin if not disposed appropriately might enter into natural bodies such as rivers, lakes, wells, and ponds causing water pollution, introducing various health issues (like antimicrobial resistance, disturbance of natural flora) and ultimately becoming a threat to aquatic flora and fauna. Therefore, the disposal of biomedical wastes has become a major problem and warrants greener alternatives for management.

A team led by Dr Mahesh Dharne and Dr Shubhangi Umbarkar from CSIR-NCL, Pune, has come up with a greener process to address this issue. The eco-friendly and rapid disintegration of biomedical-related POP waste is achieved by treating it with ammonium bicarbonate solution (20%w/v ABC) that forms non-hazardous products and value added chemicals like ammonium sulphate and calcium carbonate in the form of sludge. The ammonium sulphate $[(\text{NH}_4)_2\text{SO}_4]$ is generally used in agriculture as a chemical fertilizer and calcium carbonate (CaCO_3) can be used as a raw material for making chalks or as an additive in the cement industry for making bricks and sheets proving this as a greener, cost-effective and a value addition process.

The POP waste generated after the utilisation may carry pathogenic microorganisms. Interestingly, 20% ABC solution tested had antibiofilm, and antimicrobial activity against medically relevant fungi, yeast and bacterial strains probably due to alkaline pH-driven osmotic effect of ABC solution. Hence, 20% ABC solution finds dual eco-friendly uses i.e., in disintegration combined with disinfection of used POP that



The antimicrobial and antibiofilm activity of ammonium bicarbonate has been documented in disinfection microbiology, which also revealed that it can also disinfect the POP waste generated from patient samples.

came in contact with dental and orthopaedic tissues of patients.

The antimicrobial and antibiofilm activity of ammonium bicarbonate has been documented in disinfection microbiology, which also revealed that it can also disinfect the POP waste generated from patient samples like burns, accidents, fractures and dental problems of medical waste. Moreover, it is a good alternative for

POP incineration, which can also minimise the air pollution and keep the environment safe.

Reference

Rapid and greener method for utilization of Plaster of Paris (POP) waste generated from biomedical samples, Dharne, M et al., *Int. J. Environ. Sci. Technol.* 2019, 16, 2475-2480.

CSIR-NBRI Organises Workshop on “Gender Sensitisation and Sexual Harassment of Women at Workplace: Prevention, Prohibition and Redressal”

Prof. Agarwal elaborated on the constitution and functions of the Internal Complaint Committee (ICC), role of ICC and duty of the Employer in dealing with harassment at workplaces.

“There is a slight demarcation between harassment and sexual harassment, which needs to be understood. The incidences of sexual harassment vary from an obscene stare to violent rape.”

Ms Anju Pandey

CSIR-National Botanical Research Institute (NBRI), Lucknow, in collaboration with CSIR-Human Resource Development Centre (HRDC), Ghaziabad, organised a one day workshop on “Gender Sensitisation and Sexual Harassment of Women at Workplace: Prevention, Prohibition and Redressal” on 26 March 2019.

Ms Anju Pandey, Programme Officer, UN Woman India, New Delhi, Prof. L.R. Agarwal, Advocate, Supreme Court, New Delhi, and Dr Alok Goel, CSIR-HRDC, Ghaziabad, were the key speakers in the workshop. Dr Alok Goel informed about the genesis and purpose of the workshop. More than 250 participants including scientists, research scholars and staff from CSIR-NBRI and other CSIR sister laboratories in Lucknow participated in the workshop.

Ms Anju Pandey discussed about the need for gender sensitisation at the workplace. She said, “There is a slight demarcation between harassment and sexual harassment, which needs to be understood. The incidences of sexual harassment vary from an obscene stare to violent rape.” She added that a woman’s

silence should never be considered as her consent nor the consent given by her at any time for a particular thing should be considered as her consent for everything in the future.

Prof. L.R. Agarwal spoke on “Sexual Harassment of Women at Workplace”. He emphasised that sexual harassment not only violates the fundamental rights of a person but also violates the right to equality, employment equality, freedom of profession, freedom of life and liberty, etc. Quoting the different acts and actions that could be considered as sexual harassment, Prof. Agarwal elaborated on the constitution and functions of the Internal Complaint Committee (ICC), the role of ICC and duty of the Employer in dealing with harassment at workplaces.

He mentioned that “it is the duty of every employer to bring out a policy to deal with sexual harassment at the workplace, considering all the possible circumstances”. He concluded that organising awareness and training programmes and monitoring the progress and providing assistance in filing the cases as per requirement is an employer’s responsibility.

Workshop on Science Communication and Film Making

CSIR-NBRI, Lucknow and Vigyan Prasar, Department of Science and Technology (DST), Government of India, jointly organised a three-day workshop on Science Communication and Film Making during 28-30 March 2019. Mrs Rama Arun Trivedi, Head of Programmes, Doordarshan, Lucknow, the Guest of Honour and Dr Denzil Godin, Member of Legislative Assembly, Lucknow, the Chief Guest and Shri Nakul Parashar, Director, Vigyan Prasar inaugurated the workshop on 28 March 2019.

While briefing the objectives of the programme, Mr Nimish Kapoor, Scientist, Vigyan Prasar and Convener of the workshop, said that the main purpose of this event is to create a bridge between the scientists and filmmakers. The main activities of the workshop included scientific film script writing, production process, smartphone film production, post-production

editing and sound mixing, short film making, etc. Some award-winning short films were also screened for the participants to better understand the different concepts of science filmmaking.

Mr Ritesh Taksande, Film and Television Institute, Pune, Mr Santosh Pandey, Senior Producer, ETV Bharat, Dr C.M. Nautiyal, science communicator, Mr Sanjay Mathur, film producer, Mr Nimish Kapoor, Scientist, Vigyan Prasar, were the other faculty members who discussed about different aspects of film making as well as its limitations, plagiarism and its negative aspects.

The workshop concluded with a valedictory function on 30 March 2019. Dr Sanjay Mishra, Advisor and Head, Knowledge Involvement in Research Advancement through Nurturing (KIRAN) Division, DST, Government of India, was the Chief Guest who also distributed certificates to all the participants.



The main purpose of this event was to create a bridge between the scientists and filmmakers.

Summer Plant Science Fest 2019

A three day “Summer Plant Science Fest-2019” was organised by CSIR-NBRI, during 11-13 April 2019. Prof. A.K. Tripathi, Director, Institute of Science, Banaras Hindu University (BHU), Varanasi, was the Chief Guest at the inaugural function of the Fest on 11 April 2019. Prof. Alok Dhawan, Director, CSIR-IITR,

Lucknow and Prof. V.P. Kamboj, Former Director, CSIR-CDRI also graced the occasion.

The Fest also included a one and a half day Hindi Seminar on “Paadap Anusandhan me Naye Aayam” in which 40 research scholars, technical staff and scientists of CSIR-NBRI presented their research work in

Dr Purnima Sharma informed the participants about the financial assistance from different agencies, guidance of BCIL to young entrepreneurs for introducing new start-ups and creating market platform for their technologies and products.

At the end of the workshop, participants were able to design their own CRISPR components, validate them on DNA targets *in vitro*, transfect cells and observe phenotypes upon CRISPR mediated perturbations.

Hindi. A total of 25 oral presentations were delivered on the first day. A short science film and photographs related to plant science and nature shot by the research scholars were also showcased during the event.

Dr Purnima Sharma, Managing Director, Biotech Consortium India Limited (BCIL), New Delhi, was the Chief Guest on the second day. She informed the participants about the financial assistance from different agencies, guidance of BCIL to young entrepreneurs for introducing new start-ups and creating market platform for their technologies and products.

Dr Suchita Markan, Assistant General Manager, BCIL, New Delhi, briefed about the different

stages from the conceptualisation of technology to its commercialisation and discussed various possible bottlenecks and solutions.

The Fest concluded with a valedictory function on 13 April 2019. Prof. Alok Dhawan, Director, CSIR-IIITR, Lucknow, was the Chief Guest at the closing ceremony. Prof Dhawan discussed the “Toxicity in Plants” with various exemplary studies and cautioned about various toxic elements found in various groups of plants. He appreciated the efforts of the research scholars for successful organisation of the second annual science fest by the research scholars of NBRI. He also distributed certificates of appreciation to the participants.

Third Hands-on Workshop on CRISPR Cas9 Based Genome Editing

CSIR Institute of Genomics and Integrative Biology has been hosting an annual hands-on workshop on genome editing using CRISPR Cas9 technology. The third edition of the workshop was held at CSIR-IGIB Mathura Road campus between 8-12 April 2019. This was attended by 35 participants from all over the country and included talks and demonstrations by experts in this technology from India and abroad.

One of the highlights of the workshop was the first day's session which, after being inaugurated by Dr Anurag Agrawal, Director, CSIR-IGIB, included exciting talks by Prof.

Osamu Nureki, University of Tokyo, who described his pathbreaking work on engineering Cas9 proteins with broad targeting range. This was followed by another exciting talk by Dr Digvijay Singh, UCSD, on single molecule studies on Cas9-target interrogation.

Dr Debojyoti Chakraborty and Dr Sivaprakash Ramalingam, both from CSIR IGIB, then described their work on a new orthogonal Cas9 protein with very high specificity and applications of CRISPR in haematological disorders respectively. This was followed by a talk by Dr Siddharth Tiwari from NABI, Mohali, on his recent work on using

CRISPR for enhancing Vitamin A production in bananas.

The scientific session concluded with a talk from the sponsor. The last item of the day was a highly interactive session about mathematics in music by Shri Subhajyoti Guha, an eminent Tabla player who captivated the listeners with his exhilarating music, first as a soloist and then accompanying Dr Debojyoti who performed a sitar recital.

The remaining workshop days included intensive hands-on experiments on multiple aspects of CRISPR biology. At the end of the workshop, participants were able to design their own CRISPR components, validate them on DNA targets *in vitro*, transfect cells and observe phenotypes upon CRISPR mediated perturbations.

The participants included scientists, postdoctoral fellows, MD clinicians, PhD and MBBS students from various institutes (DBT, CSIR, Universities, Hospitals, etc.) and all responded enthusiastically about the usefulness of the workshop for their individual research needs. The entire workshop was conducted by students who formed groups with participants for discussing individual CRISPR experiments in a coordinated manner.

A gala dinner was hosted on the third day where the Honourable DG, CSIR, also interacted with the participants and listened to their experiences. The entire workshop was hosted by the labs of Drs Souvik Maiti and Debojyoti Chakraborty with support from Drs Kausik Chakraborty, Saumya Sinha Roy and Sivaprakash Ramalingam.



Events

Jigyasa 2019: Student-Scientist Connect Programme

Under Jigyasa 2019, an initiative by CSIR to motivate students towards science and technology, a one day Student-Scientist Connect Programme was organised on 9 May 2019 at the CSIR-Central Electronics Engineering Research Institute (CEERI), Pilani.

In this one-day camp, more than 150 students and teachers of Class 9, 10, 11 and 12 of various schools from Pilani took part. Shri Bhagwat

Chief Guest Mr Bhagwat Nandan addressing the school students



Mr Nandan said that social service through science is what the nation requires and all students must think about it and make their contribution in this direction in future.

Nandan, Director, Barefoot College, Tilonia (Ajmer) was invited as the Chief Guest. The programme was presided over by Dr P.K. Khanna, the Officiating Director of the Institute.

During the programme, Chief Guest Mr Bhagwat Nandan delivered a presentation on “Tackling Poverty through Science”. During his address, he described the functioning and mission of his organisation. Their organisation believes in skilling people who are without formal education and thus link common people to the mainstream of development. He said that it is a true social service to enable and strengthen the backward and deprived sections of society. Their organisation “The Barefoot College” has been serving for the upliftment of backward and deprived sections of society since 1972 and has benefited lakhs of people from 96 different countries of the world so far.

He also described the training process at their organisation wherein they provide training to women from deprived sections through visual communication and hands-on experience in developing solar lamps. They teach them about circuits and connections from scratch. They call these trained women as “Solar Mamas”, who did not have earlier exposure to any technical or formal education before they had come to their organisation.

Mr Nandan said that social service through science is what the nation requires and all students must think about it and make their contribution in this direction in future.

Earlier, the Officiating Director, Dr P.K. Khanna welcomed the Chief Guest and the students. He described science as an integral part of life and emphasised on developing a scientific temperament. He wished everyone good luck and hoped that all the students would

draw maximum benefit out of this programme. Prior to this, the Jigyasa Committee Chairman, Dr Suchandan Pal also welcomed everyone and gave a brief introduction of the Chief Guest Mr Bhagwat Nandan. Dr Pal honoured Shri Bhagwat Nandan with a memento on behalf of the Institute.

The programme was conducted by Ms Nalini Pareek, Scientist, CSIR-CEERI. She introduced all the participants to the programme’s outline and background.



Scientists and students present in the auditorium during the programme



Dr S. Pal presenting memento to the Chief Guest

Dr T. Ishwar, Scientist, CSIR-CEERI, delivered a talk on “Solar and Renewable Energy” wherein he discussed the benefits of solar energy. During the talk the students participated by asking questions about the solar energy and the science behind it.

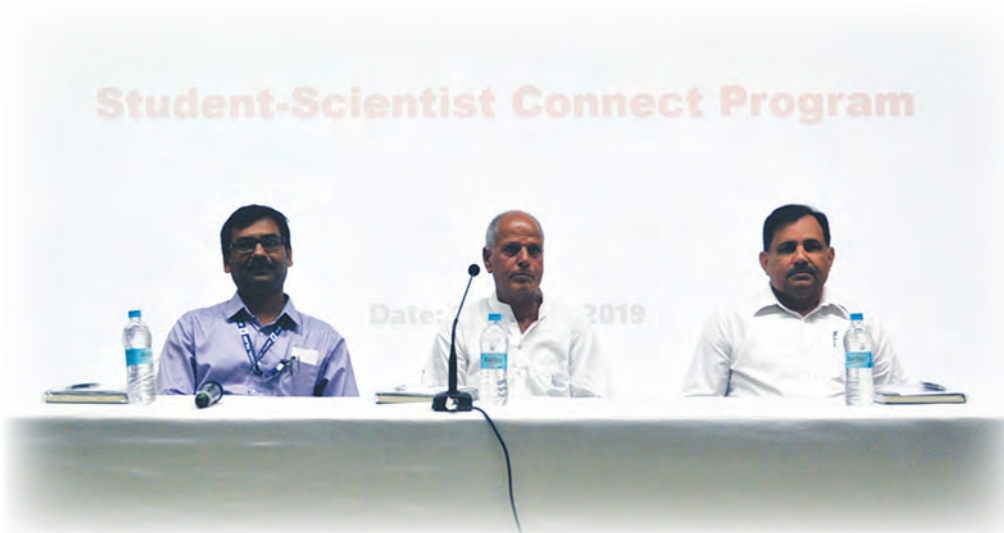
A Science Quiz was also conducted during the second half of the programme by Dr Niraj Kumar,

and Mr Anand Abhishek, Scientist, CSIR-CEERI. All the students showed great enthusiasm during the Quiz Session.

During the last session of the programme, a Science Congress was organised. The panel included Mr Bhagwat Nandan, Chief Guest, Dr P.K. Khanna, Officiating Director of the Institute and Dr Suchandan Pal, Chairman, Jigyasa Committee,



Dr P.K. Khanna described science as an integral part of life and emphasised on developing a scientific temperament.



Panel during the Science Congress

Dr T. Ishwar discussed the benefits of Solar energy. During the talk the students participated by asking questions about solar energy and science behind it.



Shri Bhagwat Nandan and his associate Shri Kiruva showing the products prepared by their organisation



Teachers participating during Science Congress

Senior Principal Scientist, CSIR-CEERI. Students and teachers also participated in the discussions.

In the end, Convener, Jigyasa Committee, CSIR-CEERI, Dr Ayan Kumar Bandyopadhyay, Principal Scientist, expressed gratitude

towards the Chief Guest. He thanked all the students and teachers for participating in the programme and wished them good luck for the future and also thanked all the colleagues associated with the event.

CSIR-CBRI Celebrates Vismit Vigyan Saptah

CSIR-Central Building Research Institute (CBRI), Roorkee, celebrated “Vismit Vigyan Saptah – The Amazing Science Week” during 22-26 April 2019 under JIGYASA: Student-Scientist Connect Programme. During the programme, a team of CBRI scientists and experts enlightened the students

and teachers of Uttarakhand state about some amazing facts of science, educated them on the new and developing technologies, interacted and brain stormed on the various areas of science and introduced them to the various aspects related to building & construction science.



World Earth Day 2019

The Week was inaugurated with the observance of World Earth Day 2019 at the Children’s Senior Academy, Roorkee.

Dr Atul Kumar Agarwal presented a lecture on the focal theme of the day “World Earth Day 2019: Protect Our Species”. He informed the students that the mindless destructive human activities

such as overexploitation of species for human consumption or sport, deforestation, habitat loss, trafficking and poaching, pollution and pesticides, etc. have rapidly reduced the plant and wildlife populations bordering on endangerment and have essentially disturbed this equilibrium. He urged students to come together to protect the most threatened



Participating Students alongwith their Teachers and Dignitaries at Children’s Senior Academy, Roorkee

species, especially bees, coral reefs, elephants, giraffes, insects, whales

and more through words, awareness and action such as daily activities to reduce individual carbon footprint, etc.



Participating students alongwith their teachers and dignitaries at Children's Senior Academy, Roorkee

He apprised the students about the initiatives of CSIR to Conserve the Endangered Species including development of conservation methodologies of various endangered plant species; non-invasive methods of DNA-based genetic characterisation of Sangai deer or Manipur brow-antlered deer — one of the critically endangered cervids in India; a satellite facility Laboratory for the Conservation of Endangered Species (LaCONES) for the creation of germplasm banks, in vitro fertilization, artificial insemination, cloning and molecular breeding of endangered species such as, lions, tigers, cheetahs, leopards, etc.

The students, scientists and teachers discussed their views on sustainable development and mitigating climate change. About 475 students of Children's Senior Academy, Roorkee, along with their teachers participated in the programme.

State-Level Scientist-Teacher Interactions

CSIR-CBRI welcomed the Teachers of 23 Kendriya Vidyalayas of Uttarakhand State for a Scientist-Teacher interaction session to discuss and debate on the new and innovative educational ideas to inculcate a scientific attitude in



Participating teachers along with the scientists & experts of CSIR-CBRI

the students. The teachers discussed various challenges faced and possible solutions for maintaining the balance between effective interactive learning activities covering all the concepts in the syllabus in a limited time-span.

Discussing the various possibilities, Dr Atul Kumar Agarwal presented a lecture on “Inclusion of Humour & Fun Facts in Science Education”. He encouraged the teachers to include humorous anecdotes, small funny science stories, and short live demonstrations, etc. as quick tools to make science learning entertaining and educational for students.

The teachers also visited the Laboratories & Technology Gallery of the Institute, interacted with scientists/experts and learnt about the latest technologies in the field of Building & Construction Science such as bio-concrete blocks, building blocks from demolition waste, fire

retardant coatings for wood/wood based products and wires, earthquake disaster mitigation, pollution monitoring and waste management, wastewater disposal system, prefab brick panel and jack arch panel system, etc.

Teachers from different Kendriya Vidyalayas of Uttarakhand State including SSB Srinagar, Gopeshwar, Upper Camp Dehradun, Haldwani Shift I & II, Ranikhet, Rajgarhi, Gwaldam, Joshimath, OLF Dehradun, IIP Dehradun, Kausani, ONGC Dehradun, BHEL Haridwar, Rishikesh, Almora, Bageshwar, NHPC Banbasa, Dharchula, Pithoragarh, ITBP II Shift & KV No. 1 & 2, Roorkee participated in the programme.

State-Level Student-Scientist Meet

A State-Level Student-Scientist Meet was organised at CSIR-CBRI,

The teachers discussed various challenges faced and possible solutions for maintaining the balance between effective interactive learning activities covering all the concepts in the syllabus in a limited time-span.

Roorkee, with the aim to inculcate scientific temper in young minds by giving them a glimpse of a live research-based learning experience.

Dr Atul Kumar Agarwal presented a lecture on “Our Scientists-our Inspiration” to inspire the students with the life and works of famous scientists of India such as Dr A.P.J. Abdul Kalam, Sir C.V. Raman, Dr Shanti Swarup Bhatnagar, Satyendra Nath Bose, S. Ramanujan, Dr Homi Jehangir Bhabha, Dr Vikram Sarabhai, Prof. M.G.K. Menon, Dr Lalji Singh, etc.

The students also visited the laboratories — Efficiency in Buildings, Fire Research, Building Processes, Plant and Productivity,

Environmental Science and Technology, Rural Technology Park and Technology Gallery – of the Institute, interacted with scientists/experts and learnt about the latest technologies in the field of Building & Construction Science.

More than 200 Students from 23 different Kendriya Vidyalayas of Uttarakhand State i.e. SSB Srinagar, Gopeshwar, Upper Camp Dehradun, Haldwani Shift I & II, Ranikhet, Rajgarhi, Gwaldam, Joshimath, OLF Dehradun, IIP Dehradun, Kausani, ONGC Dehradun, BHEL Haridwar, Rishikesh, Almora, Bageshwar, NHPC Banbasa, Dharchula, Pithoragarh, ITBP II Shift & KV No. 1 & 2, Roorkee, participated in the programme.



Participating students along with their teachers and the scientists & experts of CSIR-CBRI, Roorkee

World Malaria Day 2019 & International Girls in ICT Day 2019

World Malaria Day 2019 & International Girls in ICT Day 2019 was observed by CSIR-CBRI, Roorkee. A team of CSIR-CBRI, Roorkee scientists and experts visited Cantonment Board School, Roorkee, to encourage the students to spread awareness about the disease and prevention methods; and encouraged the students to brainstorm and bring their own new ideas, inputs, reports, surveys, etc. to help the scientists develop viable solutions to counter the problem.

Dr Atul Kumar Agarwal presented a lecture on “Mosquitoes, Malaria and More” and helped students understand the gravity of the life-threatening disease caused by the parasites transmitted to people through the bites of infected female *Anopheles* mosquitoes. Though

preventable and curable, there are over 100 million cases of malaria in over 85 countries with about 100 thousand deaths per year.

Further, he informed the students that the day is also observed as International Girls in ICT Day 2019. He encouraged girls to consider studies in the growing field of Information and Communication Technologies with focus on developing new age products for storage, retrieval, manipulation, or transmission of information digitally. ICT has become integral both as a primary research subject and a support tool for every other sector.

About 300 students of Cantonment Board School, Roorkee, along with their teachers participated in the programme.



A team of CSIR-CBRI, Roorkee scientists and experts visited Cantonment Board School, Roorkee, to encourage the students to spread awareness about the disease and prevention methods.

World Intellectual Property Day 2019

The Week concluded with the observance of World Intellectual Property Day 2019, wherein the CSIR-CBRI, team interacted with the students and staff at Kendriya Vidyalaya No. 1, Roorkee.

Dr Atul Kumar Agarwal presented a lecture on “Building Material – Past, Present & Future: Scientific Journey of CSIR and CBRI” and informed about the glorious history and achievements of CSIR and CBRI.

He said that CSIR has contributed in the upliftment of every sector and aspect of life from agriculture to aerospace, building construction to biotech, health, chemical, energy, etc. He also introduced the students to the concept of Intellectual Property (IP).

About 100 students of Kendriya Vidyalaya No. 1, Roorkee, along with their teachers participated in the programme.

Dr Ranjana Aggarwal Joins CSIR-NISTADS as Director



Dr Ranjana Aggarwal has joined as Director, CSIR-National Institute of Science, Technology and Development Studies (CSIR-NISTADS) on 24 June 2019.

Dr Ranjana Aggarwal has served as Professor of Chemistry and Director, Women's Studies Research Centre at Kurukshetra University, Kurukshetra.

She obtained her BSc, MSc and PhD degrees from Kurukshetra University. After postdoctoral research on erythromycin biosynthesis at Cambridge University, UK, she joined her Alma mater in 1995 as a lecturer. Subsequently, she worked in many well known European Labs such as Cambridge University as Commonwealth Fellow, Trinity College Dublin, Ireland and the University of Trieste, Italy. She is actively collaborating with scientists of the USA, Spain and Ireland.

Her research interests consist of design and synthesis of azaheterocycles, involving green reagents, of therapeutic interest

as anticancer, anti-inflammatory, antimicrobial and photodynamic agents, computational studies and 2D NMR spectroscopy. Recently she was granted a research grant by the Haryana State Council for Science and Technology to develop new leads to treat cancer by targeting DNA.

Her research contributions have been acknowledged in the form of awards, notably Dr Basudev Banerji Memorial Award (2014) by Indian Chemical Society and Prof. S.S. Katiyar Endowment Award (2015) by Indian Science Congress. As an accomplished academician, she has been nominated as Member of National Monitoring Committee for Minorities Education by MHRD, New Delhi. She is a visitor's Nominee for Delhi University and Central University, Assam, Silchar and Chancellor's Nominee for many Haryana State Universities.

As Director, Women's Studies Research Centre she has been actively engaged in capacity building programs, promotion of Gender sensitization and skill development particularly among rural women.

Printed and Published by

Dr Manoj Kumar Patariya on behalf of CSIR-National Institute of Science Communication And Information Resources

Dr K.S. Krishnan Marg, New Delhi -110 012 and printed at NISCAIR Press

Dr K.S. Krishnan Marg, New Delhi -110 012

Editor: Hasan Jawaid Khan; **Assistant Editor:** Sonali Nagar

Design: Neeru Sharma & Sarla Dutta; **Production:** Pankaj Gupta

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Website: <http://www.niscair.res.in>

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Annual Subscription: Rs 500; Single Copy: Rs 50.00

RN 4512/57