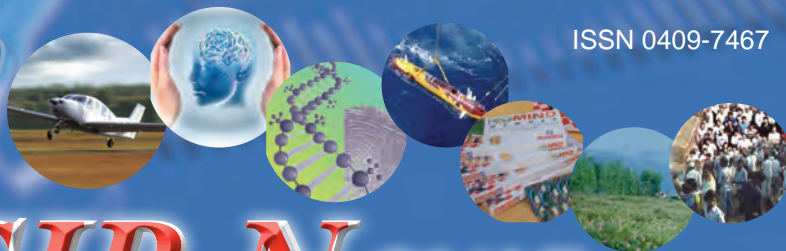




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In The News

Hon'ble Prime Minister Visits CSIR-CDRI

Reviews R&D Projects at India's Premier Drug Research Institute



HON'BLE Prime Minister Shri Narendra Modi, who is also the President of the Council of Scientific and Industrial Research (CSIR), visited the CSIR-Central Drug Research Institute (CDRI), Lucknow,

on 20 June 2017. Shri Ram Naik, Governor of Uttar Pradesh, Shri Yogi Adityanath, Chief Minister, Uttar Pradesh and Dr. Girish Sahni, Director General, CSIR, were also present.

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Glimpses of
Hon'ble PM's
visit to
CSIR-CDRI



The Hon'ble Prime Minister was shown around an exhibition showcasing the major contributions of the Institute in drug discovery and development. He was also briefed about the scientific, societal and industrial achievements of the Institute. The Institute's officials also

apprised him about the development of three new drugs for the treatment of osteoporosis, malaria and blood clot related problems. These drugs may pave the way to treating these diseases that are becoming resistant to current medication. The Institute has also recently held an inspection for Good Laboratory Practices (GLP) certification which will provide the Institute's drugs with international acknowledgement.

The Hon'ble Prime Minister took a round of the institute and reviewed the R&D activities and expressed interest in the work being done at CSIR-CDRI. Later, he also interacted with some senior scientists of the Institute. Earlier, the Prime Minister also planted a sapling of a medicinal plant in the Institute's Maharshi Charak Garden.

Road from Waste Built by CSIR-CBRI & NTPC



Concrete is the most prevalent building material for a strong foundation. Hence, NTPC-NETRA and CSIR-Central Building Research Institute (CSIR-CBRI), Roorkee, have developed high-quality fly ash based geopolymer concrete for the construction of road transforming waste into a valuable product. Waste materials like fly ash and other materials have been used for the construction of the road.

CSIR-CBRI, Roorkee has worked in synergy with NTPC-NETRA to develop a high strength, fly ash based geopolymer concrete for construction of roads as per the IRC specifications. This achievement paves the way for large-scale fly ash utilisation which is

a major industrial waste produced in mammoth quantity in India. The fly ash produced by the burning of powdered coal, from NTPC, Dadri is used for the project.

A geopolymer concrete road 50 m long and 3 m wide and having 40 MPa concrete strength has been successfully laid at CSIR-Central Building Research Institute, Roorkee using this technology. It is the first of its kind in India. The road is made from fly ash, aluminate and silicate-bearing materials. As opposed to conventional cement concrete roads, this road will not need water curing. It also paves the way for bulk fly ash utilisation. The road has been developed jointly by NTPC-NETRA and CSIR-CBRI.



Indian Highway Capacity Manual to be Developed by CSIR-CRRI



The study aims at analysing the characteristics of the heterogeneous traffic flow to identify appropriate distributions of various variables influencing the traffic stream characteristics by examining the traffic flow characteristics through extensive field data collection and analysis.

Indian traffic characteristics are fundamentally different from those in the developed countries. Even driver behaviour is vastly different from developing economies like China and Indonesia. Consequently, a study was undertaken by the CSIR-Central Road Research Institute (CSIR-CRRI) at the national level to develop an Indian Highway Capacity Manual (Indo-HCM).

The Indo-HCM has been undertaken on priority in the form of a mission mode project by considering the various categories of Indian roads like Expressways, National Highways (NHs), State Highways (SHs), Major District Roads (MDRs), Other District Roads (ODRs) and Urban Roads (UR) separately.

The principal goal of this research is to study the nationwide characteristics of road traffic and develop a manual for determining the capacity and Level of Service (LoS) for varying types of inter-urban roads and urban roads separately by including controlled intersections i.e. signals and roundabouts and

uncontrolled intersections along with addressing the capacity of various forms of pedestrian facilities existing on different types of roads.

To accomplish the stated goal, the study aims at analysing the characteristics of the heterogeneous traffic flow to identify appropriate distributions of various variables influencing the traffic stream characteristics by examining the traffic flow characteristics through extensive field data collection and analysis.

Typical Heterogeneous Traffic Flow Conditions on Indian Roads:

Indo-HCM is being executed by CSIR-CRRI in coordination with some of the reputed academic institutes in the country which include the Indian Institute of Technology (Roorkee), Indian Institute of Technology (Bombay), Indian Institute of Technology (Guwahati), School of Planning and Architecture (Delhi), Sardar Vallabhai Patel National Institute of Technology (Surat), Indian Institute of Engineering & Science

University (IEST), Shibpur, Howrah and Anna University (Chennai).

The research endeavour elaborates on study methodology for capacity estimation, Level of Service (LoS) and the associated study deliverables of varying types of Indian road facility. The developed manual is a practical tool for practising engineers and planners to mitigate the traffic and infrastructural problems.

Development and Application of Technologies for Sustainable Transportation (SUSTRANS):

The current trend of infrastructural development in India has led to increased number of private vehicles and reduced trips of public transport, indicating that priority settings for sustainable modes and road infrastructure have not been considered effective. Traditional transportation system planning mainly focuses on the current and future demands in limited areas and cannot cope with the dynamic changes in the system.

Sustainable development is a holistic practice that includes efforts to mitigate negative effects on every part of the road infrastructure and transportation system which are generally ignored in traditional transportation system planning. Sustainable transportation system considers social, economic and environment issues and the interconnections among these.

In urban India, transportation needs are increasing exponentially. The need to plan for sustainable transport is evident since global warming poses significant challenges for cities. The design of appropriate NMT which has a high potential towards sustainable transport system with suitable road infrastructure would cause shift to

these sustainable transport modes.

Sources of natural mineral aggregates are also depleting fast due to massive infrastructure development and road construction activities going on in India which consume a huge quantity of material and enormous amount of energy. To cope with this situation, there is an urgent need to develop technologies to utilise waste & marginal materials, and innovative designs to achieve a reduction in pavement thickness using high-performance materials. Accordingly, the estimation of carbon footprints from such technologies is also very much essential to consider the sustainability aspect.

Hence, it is very much necessary to carry out this proposed study. The outcome of the study would finally lead to increase in GDP of the country from the huge savings in the construction cost, reduction in traffic congestion, emissions, energy and accidents and the conservation of depleting aggregate resources.

The objectives of the present research study are conceived under following two modules:

(i) Transportation Module:

- a) Development of quality enhancement of public transport system
- b) Development of feeder transport system and parking facilities at public transport terminals
- c) Design of advanced public transport information systems using ITS technologies
- d) Design and development of Desktop Car Driving Simulator
- e) Development of sustainable Non-Motorised Transport (NMT) system
- f) Development of policy level sustainable strategies to restrict/control usage of private vehicles
- g) Development of sustainable integrated mass transportation system



Sustainable development is a holistic practice that includes efforts to mitigate negative effects on every part of the road infrastructure and transportation system which are generally ignored in traditional transportation system planning.

h) Evaluation of sustainable transportation system (environment, social and economy)

(ii) Road Module

- a) Development of innovative techniques for utilisation of waste and marginal materials in road construction
- b) Conversion of Chromium containing solid waste generated in leather industry into pavement materials
- c) Improved design methods and materials/mixes towards achieving Reduced Pavement Thickness
- d) Development of Technology SUPERior PERforming Bituminous PAVements (SUPERPAVE)
- e) Development of warm mix technologies for road construction
- f) Development of designs for using reclaimed asphalt pavement (RAP) in construction and maintenance of roads

g) Estimation of carbon footprints in the road construction process.

Finally, framework and guidelines to design a sustainable integrated mass transportation system and NMT system for any given city and also guidelines to develop sustainable public transport.

Societal Benefits

- By adopting the developed guidelines for Sustainable Public Transport and NMT Guidelines, it is estimated that congestion on the urban roads would be reduced by 10% because of modal shift from private vehicles to public transport and NMT which can lead to savings of about 750 crores annually in any city.
- By training the drivers and accordingly testing for issuing driver licenses utilising present driving



Journey Sections	Weighted Average		
	Journey Distance (in km)	Journey time (in min)	Journey Cost (in Rs.)
Origin to metro	1.8 (11%)	10.3 (22%)	9.60 (28%)
Metro to destination	1.4 (9%)	9.5 (20%)	8.30 (24%)
In metro	12.5 (80%)	27.4 (58%)	16.40 (48%)
Total Journey	15.7 (100%)	47.2 (100%)	34.30 (100%)



simulator may also improve road safety situation on Indian roads due to more driver discipline and reduced number of accidents would lead to at least savings of about 400 crores annually at the national level.

- Designing of Sustainable Roads adopting the guidelines developed in this project in terms of utilising waste material and RAP to conserve natural resources (about 5 lakhs/km/lane), saving of material by reducing thickness of pavement (about 10 lakhs/km/lane), reducing energy through half warm mix by 80% and material saving in terms of about 0.5 lakh/km/lane, reducing maintenance through long lasting pavements (about 5 Lakhs/km/lane) would at least lead to huge savings at the national level.

Global Benchmarking of Achievements

- Development of Indigenous Car Driving Simulator, Database for Utilisation of Waste Materials for Road Construction, Harder Grade Bitumen and Highly Modified Hybrid Bitumen achieved in the project which would lead to recognition and advancement of CSIR's position globally and obviously achieve huge savings for the nation.
- Received Order-of-Merit Award for the present Project under Smart Technologies by SKOCH Group in 2015.

Promising Leads/Technology/Product Proposed for Further Translation

- Utilisation of Waste Materials like Red Mud, Foundry Sand and Jarosite in road construction.
- Recycled Asphalt Pavement (RAP) materials in road construction and maintenance

- Rejuvenating Agent for treatment of RAP.
- Bitumen modified with Nanofibrous carbon (BNF synthesised from leather waste
- Integrated Intelligent Dynamic Information System for Public Transport.
- Superior Performing Bituminous Technology for Long Lasting Pavements.
- Warm Mix Technology for Bituminous Roads.

Estimation of Fuel Consumption during Idling of Vehicles at Bikhaji Cama Place Intersection and Savings after Employing Suitable Mitigation Measures:

The idling during Red phase at signalised intersections contributes significantly to total Fuel Loss. A small amount of fuel aggregated over a number of cycles per day, a number of days per month and number of signalised intersections become a huge quantity. PCRA entrusted CSIR-CRRI with a research project with the following objectives:

- Quantification of fuel loss during idling of vehicles at selected intersection.
- To know the effect of awareness programme on switching-off behaviour.
- To estimate the saving potentials of engine switching-off behaviour at



selected intersection.

- To compare fuel loss and emission change 'before and after' employing mitigating measures (Switching off engines of vehicles).

The study was divided into three phases: 'BEFORE' scenario, where the existing situation without any intervention was assessed. Then a one-week rigorous Awareness Campaign was undertaken. A Switching Off behaviour assessment survey was conducted 'DURING' the ongoing campaign and 'AFTER' the seven-day campaign was over.

Various types of primary & secondary data have been collected including Classified Traffic Volume Counts (CTVC), delay studies; switching-off behaviour observations, fuel consumption and emission levels. At-grade traffic observed at the intersection was 1.03 lakh; out of this 62161 (62% of total traffic) is potential traffic that can switch off during idling. A rigorous on-site campaign was undertaken to employ the above measures to draw the attention of the vehicle drivers during the campaign and spread the message of switching off their vehicles during Red Phase.

More than 50,000/- bilingual pamphlets were distributed to the

drivers directly during idling, and with the help of newspaper distributors advertisements were published in English and Hindi newspapers as well. On-site banners, stationary boards, enumerators holding placards, etc. were at the site for seven days.

A number of switched off vehicles were observed during all three scenarios manually. 19.96% vehicles were observed switching off before campaign which increased to 62.33% during the campaign and reduced to 52.88% after the campaign. Apart from this, 7.15% increase in switching-off behaviour has been observed due to corrected positions of countdown timers. Estimated fuel savings in monetary terms is ₹5499, ₹17368 and ₹13518 for "Before", "During" and "After" scenarios respectively.

The CO₂ loads reduction in 'Before' scenario were 280.23 Kg per day due to switching off the vehicles during the Red Phase. With the increase in the incidence of switching off, the reduction in pollutant loads was estimated to be 893.38 Kg per day and 689.03 Kg per day 'During; and 'After' campaign respectively. In other pollutants like NO_x and CO, similar trends were observed.

**IF RED LIGHT IS FOR MORE THAN 20 SECONDS
PLEASE TURN OFF YOUR ENGINES**

कृपया अपने वाहन का इंजन बंद करके रखे यदि लाल बत्ती 20 सेकेंड से अधिक हो

Save Money!! Reduce Pollution!! Protect your Health!!

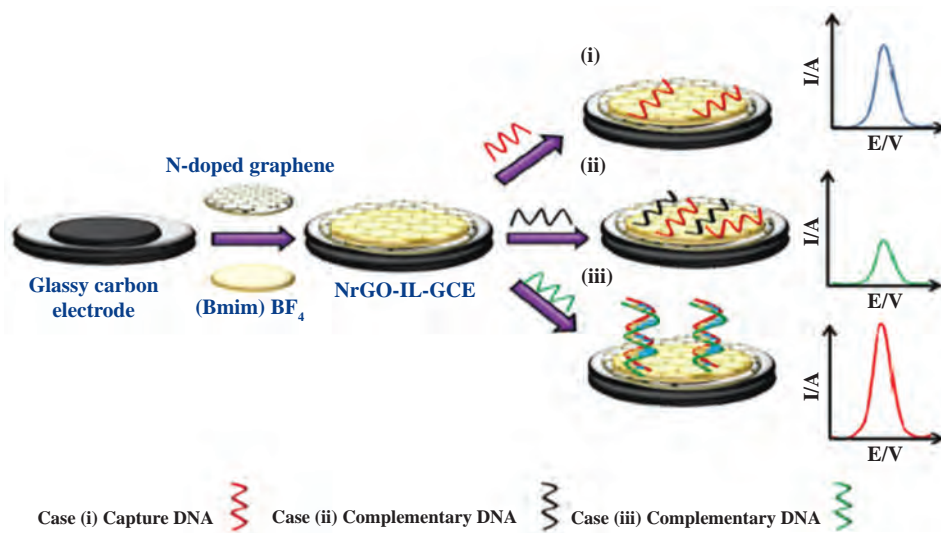
R & D Highlights

Label-free Technique for Rapid Electroanalysis by CSIR-CECRI

Researchers from CSIR-Central Electrochemical Research Institute (CECRI), Karaikudi, have demonstrated a label-free ionic liquid (1-butyl-3-methylimidazolium tetrafluoroborate) modified nitrogen doped graphene electrode for the discrimination of DNA mutations (i.e. towards discriminating complementary, non-complementary, 1-base mismatch and 2-base mismatch sequences).

It is a label-free technique, and therefore it does not require any expensive labels or dyes and is therefore cost-effective. This proposed platform exhibited excellent sensitivity, and the electroanalysis is rapid. The method demonstrated is label-free and is expected to have potential applications for the detection of other biomolecules.

Scheme 1: Proposed platform employed for the DNA mutation analysis (Re-used with permission from the original article)



Reference: Sensors and Actuators B: Chemical 247, 556-563 (2017)

Dr. Subbiah Alwarappan, the lead researcher of this work, says that if the same protocol is followed in a multi-electrode array, multiplexed detection is possible in a single analysis.

Waste-To-Wealth

Recovery of Sulphur from Contaminated water

Waste or by-products discharged from industries are hazardous to the environment as they contaminate the surface water, ground water and soil. Sulphate is one of these contaminants that deeply contaminates the water bodies, agricultural fields and soil resources. Sulphate from sewage wastewater and industrial effluents can lead to many health risks and is also disastrous to the environment.

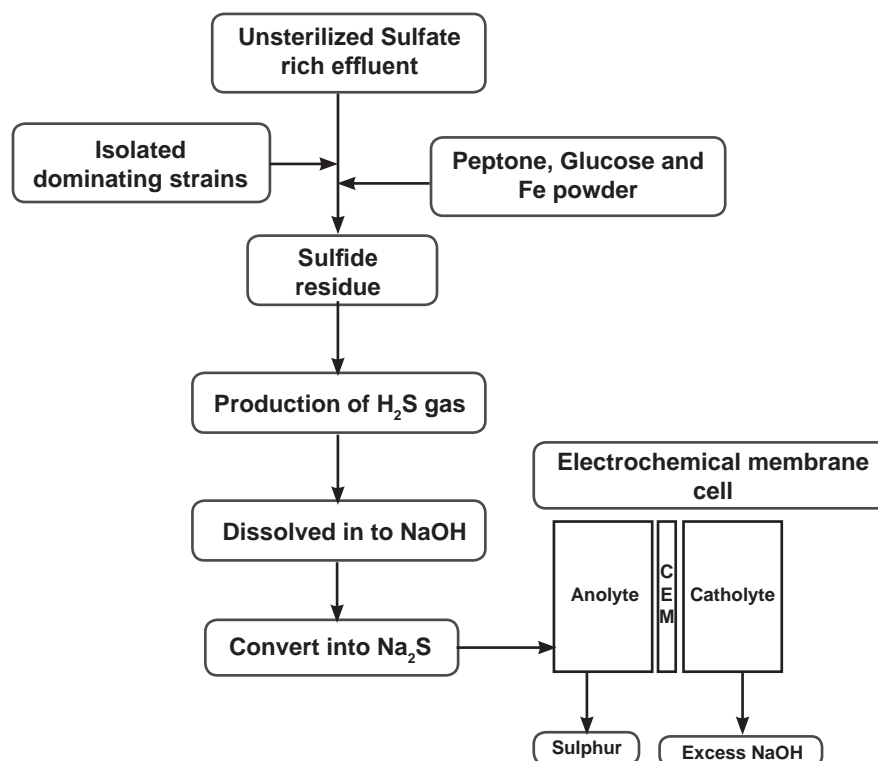
The removal of sulphate or reducing its concentration from wastewaters is

most essential. A new bio-electrochemical method has been successfully developed by a group of researchers from the CSIR-Central Electrochemical Research Institute (CECRI), Karaikudi, in Tamil Nadu. The study has been published in the journal *Separation and Purification Technology*.

The new approach



Flow chart of sulphur recovery process using bio-electrochemical process



Reference: Selvaraj, Hosimin, Karthikeyan Chandrasekaran, Raja Murugan, and Maruthamuthu Sundaram. "An integrated biological and electrochemical process for recovery of sulfur from an industrial effluent contaminated pond water and its preliminary application in high performance battery." *Separation and Purification Technology* 180 (2017): 133-41. doi:10.1016/j.seppur.2017.01.069.

involves the conversion of sulphate from contaminated water to sulphur using an integrated approach of biological (Sulphate Reducing Bacteria, SRB) and electro-oxidation process. This approach converts the waste sulphate into a valuable product which can then be used in high-performance batteries.

Sulphate gets reduced into sulphide or hydrogen sulphide gas with the help of Sulphur-reducing bacteria under anaerobic conditions. Sulphur-reducing bacteria which live in oxygen-deficient environments use sulphur as an energy source instead of oxygen and produce hydrogen sulphide.

During the process, three existing dominating facultative anaerobic and micro-aerobic bacteria such as *Stenotrophomonas*

maltophilia, *Bacillus cereus* and *Bacillus licheniformis* were isolated from contaminated water for reduction of sulphate to sulphide and formed as transition metal sulphide residue. The biological metal sulphide residue was then converted into alkaline metal sulphide and oxidised into elemental sulphur by the electrochemical process.

The recovered sulphur was used as a cathode in energy storage device (Li-S battery). The cyclic voltammetry and charge-discharge profile demonstrated that the recovered sulphur can be utilised as an active cathode material for Li-S battery which offers significant performance enhancements beyond the conventional and advanced Li-ion batteries.

CSIR Signs Agreement with MIDI, Ethiopia



The Council of Scientific and Industrial Research (CSIR) and the Metal Industries Development Institute (MIDI), Ethiopia, have joined hands by signing the agreement to implement a twinning programme, which is one of the biggest projects between CSIR Institutes and a foreign entity in pursuance of high level commitment to enhance science and technology areas between India and Africa.

The agreement was signed by the Director of National Metallurgical Laboratory (CSIR-NML), Jamshedpur, on behalf of the participating CSIR Labs, and the Director General of Metals Industry Development Institute (MIDI), Addis Ababa, Ethiopia, in the presence of H.E. Dr. Alemu Sime, State Minister

of Industry, Federal Democratic Republic of Ethiopia, H.E. Mr Teshome Lemma, State Minister of Education, Federal Democratic Republic of Ethiopia, Dr. Girish Sahni, Director General, CSIR and H.E. Mr Anurag Srivastava, Ambassador of India to Ethiopia, Djibouti and African Union.

CSIR will enhance the capacity of MIDI under the twinning programme to help it contribute more efficiently towards the advancement of Metals and Engineering areas in Ethiopia and thus enhance their competitiveness. This collaboration will give training opportunities, scholarships in the best Indian S&T institutes, joint research as well as the transfer of skills and knowledge via telemedicine and tele-education.

CBRI Organises Student Awareness Programme



Participants and Scientists attending the Programme

The CSIR-Central Building Research Institute (CBRI), Roorkee, organised a Student Awareness Programme under the CSIR Scheme, “Faculty Training, Motivation & Adoption of Schools & Colleges by CSIR Labs”, for science

students of classes 11th and 12th on 26 May 2017. The programme was attended by more than 100 science students of Asha Modern International School and Sofia House of Children’s Senior Academy, Roorkee, along with their faculty members including Dr. Anuj Kumar Sharma, Mr Manu

Malhotra, Ms Deepti Jain, Mrs Nisha Vashishtha and Ms Sadiya Hasan.

Dr. N. Gopalakrishnan, Director, CSIR-CBRI, welcoming the students said that science is very curious. It is a concept and the physical manifestation of this concept, that helps the society, is technology. He said that we need to find ways to explore science for the benefit of mankind so as to improve health, income and living standard of the common masses.

He said that civil engineering is the oldest science that creates a habitat, resisting the forces of nature with the principles of science. It has further evolved with adoption and incorporation of modern technologies. He said that the brick-making technique was present even in the time of Mohenjo-Daro, but with latest developments such as nanotechnology, this technique has evolved to newer levels. Now we need to take science to people with sustainability. He encouraged students to question, imagine and build up curiosity, as



Dr. N. Gopalakrishnan, Director, CSIR-CBRI during his Presidential Address

curiosity has its own reason for existing and imagination crosses the limits of knowledge to encircle the world. He motivated the students to become a scientist.

Dr. Suvir Singh, Chief Scientist, CSIR-CBRI, presented an informative lecture on “Fire Research”. He said that the basic forces for the sustenance of fire are air, heat and fuel, which are universally present. Thus, the occurrence of fire cannot be stopped. It can only be minimised and contained. With the help of two case studies, he explained how fire spreads inside and outside a building, the time taken by the fire to spread and how to minimise loss. He informed the students about various structural elements that are responsible for the spread of fire and the latest technologies developed to protect them. With the help of short video films, he depicted the initial, growth, flashover, fully developed, decay and spread stages of fire.

He also showed various clips depicting the fire resistance of newly developed building structure elements such as fire-resistant glasses and thermal



Lecture by Dr. Suvir Singh,
Chief Scientist, CSIR-CBRI

shock protected columns. He talked about the technologies developed for the prevention, protection and confinement of the fire. He emphasised on the presence of an efficient fire escape to minimise loss.

Dr. R.D. Dwivedi, Principal Scientist, CSIR-CIMFR Regional Centre, CBRI Campus, Roorkee, presented an enlightening lecture on “Exposure to Tunnel Engineering”. He informed about the importance of tunnelling stating that a tunnel shortens the distance thus reducing fuel and carbon emission. It prevents weathering of the path due to extreme conditions, avoids accidents and traffic jams due to landslides and earthquakes and protects from extreme climatic conditions.

He informed the students about the uses of the tunnel, the various techniques and the equipment used such as drilling, blasting and tunnel boring



Lecture by Dr. R.D. Dwivedi,
Principal Scientist, CSIR-CIMFR Regional
Centre, CBRI Campus, Roorkee



We need to find ways to explore science for the benefit of mankind so as to improve health, income and living standard of the common masses.

Dr. N. Gopalakrishnan
Director, CSIR-CBRI

machine. He explained these concepts with short videos of the recently inaugurated Chenani-Nashri tunnel in Jammu & Kashmir. This 9-km long tunnel shortens the 42-km long distance between the Chenani and Nashri cities while protecting the travellers from the forces of nature. The main tunnel is provided with an escape tunnel, with escape routes at regular intervals to provide a quick and safe exit in case of an emergency.



Lecture by Dr. Atul Kumar Agarwal,
Senior Principal Scientist and
Programme Coordinator, CSIR-CBRI



Students visiting CSIR-CBRI Laboratories

Dr. Atul Kumar Agarwal, Senior Principal Scientist and Programme Coordinator, CSIR-CBRI, motivated the students through his lecture on “Career Opportunities”. He said that education should be such that forms character, increases the strength of the mind, expands intellect, and enables one to stand on one’s own feet.

He informed the students about numerous professional courses, open and distance learning system, and a vast sea of career opportunities in advertising, biotechnology, computer training, distance learning, engineering, finance, hotel management, information technology, law, mass communication, service and tourism, etc.

He also informed that the Institute is starting a unique opportunity for students of classes 9th to 12th, to discover the meeting point of science and creativity at CSIR-Central Building Research Institute, Roorkee. The programmes will arouse scientific curiosity and passion in children through interactions with scientists, experiments, laboratory visits, talks and display of technologies and research. Also, selected students will get a unique opportunity to submit their innovative

research proposal to pursue for 2-4 weeks at CSIR-CBRI, Roorkee during vacations under the CSIR Scheme of “JIGYASA-Quest for Curiosity”.

Dr. Abha Mittal, Senior Principal Scientist, CSIR-CBRI presented the formal introduction of all the speakers and also presented a vote of thanks.

The participants visited the labs of CSIR-CBRI, Roorkee, and learned about the newest developments and technologies by the Institute. A science film featuring CBRI scientific innovations and success stories was also screened. The students also had an interactive session with the Institute’s scientists where they put their curiosity to rest and quenched their thirst for knowledge.



Dr. Abha Mittal, Senior Principal Scientist, CSIR-CBRI presenting the Vote of Thanks



The Institute is starting a unique opportunity for students of classes 9th to 12th, to discover the meeting point of science and creativity at CSIR-Central Building Research Institute, Roorkee. The programmes will arouse scientific curiosity and passion in children through interactions with scientists, experiments, laboratory visits, talks and display of technologies and research.



Students visiting CSIR-CBRI

Conference on Sustainable Catalytic Technologies at CSIR-NCL



Dr. Paul Ratnasamy, Former Director, CSIR-NCL felicitated by Prof. Ashwini Kumar Nangia, Director, CSIR-NCL

The field of catalysis has essentially brought chemists, chemical technologists, biologists, physicists, chemical engineers all together at a single platform getting out most transformations which seem difficult to conduct without the catalysts, he added.

CSIR-National Chemical Laboratory (CSIR-NCL), Pune, organised a two-day conference on “Sustainable Catalytic Technologies” in honour of Dr. Paul Ratnasamy, Former Director, CSIR-NCL, on the occasion of his 75th Birthday. He joined CSIR-NCL in 1980 and led the laboratory from 1995-2002. The conference was inaugurated by Prof. M.M. Sharma, Former Director, Institute of Chemical Technology, Mumbai, on 8 June 2017.

Prof. M.M. Sharma and former CSIR-NCL Directors Dr. Sourav Pal and Dr. Vijayamohan K. Pillai, former Dy. Director, CSIR-NCL, Dr. B.D. Kulkarni, former HoDs of Catalysis and Inorganic Chemistry Division Dr. A. V. Ramaswamy and Dr. Rajiv Kumar, present HoD Catalysis and Inorganic Chemistry Division, Dr. Darbha Srinivas, and Director, CSIR-NCL Prof. Ashwini

Kumar Nangia spoke while felicitating Dr. Paul Ratnasamy. The distinguished speakers remembered his contributions to science and R&D management of the institute as well.

Prof. M.M. Sharma in his inaugural talk said that the utilitarian part of research invigorates rigours of fundamental research. He underlined that Silver, Gold and Platinum are significantly used as the catalyst for certain reactions. Dr. Paul Ratnasamy utilised Platinum as catalyst for Xylene isomerisation which is considered as a vital contribution. The field of catalysis has essentially brought chemists, chemical technologists, biologists, physicists, chemical engineers all together at a single platform getting out most transformations which seem difficult to conduct without the catalysts, he added.

Prof. Sharma asserted that the catalyst does absolute miracles in the field of chemistry. It can do chopping and stitching of the molecules, dancing of molecules can be done on catalyst surfaces. He quoted a line that he liked which says, “A dollar spent on research on catalysis generates an output of 100 to 400 dollars”. Catalysis has a great advantage of commercial benefits.

After the inaugural address, Dr. Stephan Jaenicke, National University of Singapore, Singapore, gave the Endowment Lecture on Catalysis honouring Dr. Paul Ratnasamy on the title “Back to the Future — Bio-based Chemistry: Yesterday, Today and Tomorrow”.

The conference covered very significant talks by dignitaries from CSIR-NCL, sister labs from CSIR and industry partners. Dr. S.S.V. Ramakumar, Director-R&D, IOC, Faridabad, talked on “Challenges and opportunities in Refining Catalysis: Indian Oil’s Efforts”.

Prof. Mahendra Sunkara, Director, Conn Centre for Renewable Research, University of Louisville, Louisville, USA, talked on the subject “High-Performance Catalysis, Adsorbents and Electrocatalysts by Design”. Dr. Anjan Ray, Director, CSIR-IIP, Dehradun gave a lecture on “Catalytic Approaches to Biofuels Production”.

On the second day of the seminar, Dr. R.V. Jasra, Senior Vice President, RIL, Vadodara spoke on Developing Catalytic Technologies at Reliance Industries Ltd...the Legacy Lives on. A talk on the subject “Catalysis Challenges in Commercialisation of Technologies” was given by Dr. Kishan Gurram, Site Director, SABIC Technology Centre, Bengaluru. Mr P.A.E.S. Srinivas, Sud-Chemie India Ltd., New Delhi, gave a talk on the subject “Air Purification



Prof. M.M. Sharma, Former Director, Institute of Chemical Technology, Mumbai delivering the inaugural address

Catalysts”.

Dr. Chandrasekhar V. Rode, Chief Scientist, CSIR-NCL, talked on the topic “Catalyst and Process Development for Liquid-phase Hydrogenolysis of Glycerol to Glycols”. Prof. Sourav Pal talked on “Clusters Catalytic and Functional Materials: Computational Design” while Prof. P. Selvam, National Centre for Catalysis Research, Chennai, spoke on “Nanostructured Materials and their Applications in Catalysis”.

Prof. Vijayamohan K. Pillai gave a lecture on “Can Nano-carbon-based Electrocatalysts help to realise Pt-free Fuel Cells”. Dr. Pramod Kumbhar, Praj Industries, Pune, spoke on “Catalysis for Renewable Chemicals”. The concluding lecture was by Dr. D. Srinivas who expressed his thoughts on “NCL’s Biodiesel Technology: Journey from Lab to Market”.

More than 40 posters on Catalysis Research and Technology Development from different divisions viz., Catalysis & Inorganic Chemistry, Organic Chemistry, Physical & Materials Chemistry, Biochemical Sciences and Chemical Engineering were presented by the research students during the seminar.



Prof. Sharma asserted that the catalyst does absolute miracles in the field of chemistry. It can do chopping and stitching of the molecules, dancing of molecules can be done on catalyst surfaces.

Events

CSIR-NISCAIR Celebrates World Environment Day 2017

“Connecting People to Nature”

Media can help connect Science to Nature. It is important to be vigilant towards environment related issues.

Dr. Manoj Kumar Patariya
Director, CSIR-NISCAIR



Dr. Manoj Kumar Patariya, Director, CSIR-NISCAIR welcoming the speaker

On the occasion of the World Environment Day on 5 June 2017, the CSIR-National Institute of Science Communication and Information

Resources (NISCAIR), New Delhi, organised a lecture by Ms Deepa Chandra, Additional DG, Doordarshan and Head, DD National on “Connecting People to Nature” — the theme of the year 2017.



Ms Deepa Chandra delivering the lecture

Ms Deepa Chandra has been associated with radio and television since 1984 and has worked in different capacities both in the production as well as the management of public service broadcasting in India. In 2016, she participated as a jury member in the International Documentary Film Festival organised by Turkish Radio Television Cooperation, Istanbul. She is a member of the jury for selection of community radio awards for the Ministry of Information and Broadcasting. She is also a member of the National School of Drama Society, New Delhi. She has been awarded the Shastri Indo-Canadian Fellowship for a study on Ethnic

Media. She was also awarded One World Broadcast Fellowship in London, UK.

Chairing the event, Director, CSIR-NISCAIR, Dr. Manoj Kumar Patairiya, gave insights into how media can help connect science to nature. He said that it is important to be vigilant towards environment-related issues. He cited a recent observation by the Supreme Court that near the Yamuna-Pusta area many fruits and vegetables grown by local people can be carcinogenic if consumed. Supreme Court has put a ban on it and suggested the local people to grow ornamental flowering plants which are neither medicinal nor consumable, to save their livelihoods. This is how we connect people to nature and bring out the solutions. These are clues for people who are working in science communication and environment and other areas, he said.

Ms Deepa Chandra asked the gathering, why do we need an Environment Day? She discussed the importance of Gurukuls in ancient time where a king's son and a common man's son were taught together, and they used to live with their Gurus in a jungle and reside in mud huts. What else could have

been more close to nature than this. It is important to experience and explore the nature to feel it at ground level rather than seeing beautiful sceneries on television.

Ms Chandra said that a term that is used more often today is 'Intergenerational Equity', which means leave this world as you found it for your next generation. Are we leaving the Earth as we found it, she asked. We easily get influenced by the western culture, and today's modernisation is keeping us away from nature while the concept of Shanti Niketan given by Rabindra Nath Tagore in his time was a step to connect with nature, she said.

She asked the gathering to bring nature closer to their homes by growing plants in small pots, developing kitchen gardens, walking on grass in high rise metro cities like Delhi and Mumbai. She suggested joining summer schools and various other bodies across the world like Youth Hostel Association and World Wildlife Fund, which organise environmental tours for students to explore nature. Besides, Yoga is another way that gets your vibrations directly to the mental state where you focus all your energies and feel connected to nature. It



Ms Chandra said that a term that is used more often today is 'Intergenerational Equity', which means leave this world as you found it for your next generation. Are we leaving the Earth as we found it, she asked.



boosts the energy level. Getting close to nature is a great stress buster, she added.

Ms Chandra said that we do not value the gift of nature unless we are affected. Citing some examples, she said that we breathe clean, fresh air, and we take things for granted. When we get to know that it is no more pure, it has been polluted, the sulphur particles have increased, and it can now choke our breathing, then we realise how precious it was and start caring for it. We consider cycling as a poor man's

vehicle, but it is a rich man's exercise machine.

With our indulgence, we can create a harmony between humanity and nature, so that both can evenly thrive, she said. Ms Chandra ended her lecture by quoting that "We will conserve what we love, we will love only what we understand, and we will understand only what we learn." So it is essential that we start learning and start loving nature.

Contributed by Ms Kirti Bansal and Ms Sonam Choudhary, CSIR-NISCAIR

International Yoga Day Celebration at CSIR-NISCAIR

"Yoga for Harmony and Peace"

Although we have been practising yoga for decades, it is only our Hon'ble Prime Minister who has given a boost to Yoga and that has been recognised by the United Nations.

Dr. Manoj Kumar Patariya
Director, CSIR-NISCAIR



Dr. Manoj Kumar Patariya, Director, CSIR-NISCAIR welcoming the guest

Yoga, which is considered as a 5000-year-old physical, mental and spiritual practice, has its origin in

India. The aim of yoga is to transform both the body and the mind. Realising its universal importance, in 2014, the

United Nations proclaimed 21 June as the International Yoga Day worldwide to raise awareness of the benefits of yoga. This year, the theme is “Yoga for Harmony & Peace”.

On the occasion of the International Yoga Day on 21 June 2017, CSIR-National Institute of Science Communication And Information Resources (CSIR-NISCAIR), New Delhi, organised a talk by Dr. Rajeev Rastogi, Assistant Director, Central Council for Research in Yoga and Naturopathy under the Ministry of Ayush and a Yoga demonstration by Ms Pinki Ghanghas, Yoga Therapist.

In his opening remarks, Dr. Manoj Kumar Patariya, Director, CSIR-NISCAIR, said that although we have been practising yoga for decades, it is only our Hon'ble Prime Minister who has given a boost to Yoga and that has been recognised by the United Nations. He said that physical exercise is helpful for making our body, mind and soul healthy, and regular exercise not only enhances the immune system but also enhances our thinking power, decision-making ability, studies, etc. So exercise is essential for our overall living system's mechanism.

The Guest speaker was Dr. Rajeev Rastogi who is Assistant Director, Central Council for Research in Yoga and Naturopathy under the Ministry of Ayush and has almost 30 years of experience in the field of Yoga and Naturopathy. He has to his credit more than 30 research papers in peered reviews and indexed journals. He has also authored more than 40 books on Yoga and Naturopathy.

Addressing the gathering, Dr. Rastogi said that yoga is a science that originated in India. There are a lot of references and Indian texts which signify the Indian origin of Yoga. He

said that in the Council, several strategies have been developed to utilise yoga as a therapy. The Council also runs a hospital at Rohini, Delhi, where almost



Dr. Rajeev Rastogi, Assistant Director, Central Council for Research in Yoga and Naturopathy



Dr. Manoj Kumar Patariya welcoming Ms Pinki Ghanghas, Yoga Therapist

Dr. Rastogi said that in a metropolitan city life is full of stress and pollution and we have adapted a mechanical lifestyle. Stress, anxiety, irritation, depression, etc., are all primary causes of diseases and yoga tries to eliminate the root cause of these diseases.

100-150 patients suffering from several psychosomatic disorders like diabetes, high blood pressure, insomnia, etc. are treated every day.

He further explained that in naturopathy and yoga no medicine is used – the diet acts as a medicine. Dr. Rastogi said that in a metropolitan city life is full of stress and pollution and we have adapted a mechanical lifestyle. Stress, anxiety, irritation, depression, etc., are all primary causes of diseases and yoga tries to eliminate the root cause of these diseases. He said that food is directly connected to immunity, whatever you are eating is your medicine. He stated that the yogic diet includes natural things. It should not be contaminated with unnatural or artificial foods. The diet should have 60:40 ratio with 60 percent uncooked or raw food and 40 percent cooked food. Most of the disorders can be managed by following this diet pattern.

He said that it is necessary to maintain ones lifestyle by ones 'Aahar-Vihar and Achar-Vichar'. The main reasons for all the problems are odd living habits, diet and thinking habits,

etc. Eat on time, eat a balanced diet, connect to nature, follow laws of nature, create harmony with nature, be optimistic and think positive – these are some of the solutions. It's beneficial to adopt and incorporate yoga as a part of your daily routine, he emphasised. He said that earlier we used to say that "prevention is better than cure", but now we believe that "prevention is the only cure". Yoga and Naturopathy systems are independent, and they can be taken as additional therapies with other medicine systems. These therapies are cost-effective, simple, easy to adopt, eco-friendly and most importantly they work on root causes of the illness and eliminate them completely.

On the occasion, a special supplementary issue of the Indian Journal of Traditional Knowledge (IJTK) — "Yoga in Healthcare" – was also released by Dr. Manoj Kumar Patariya, Director, CSIR-NISCAIR, along with Dr. Rajeev Rastogi and Dr. K. P. Singh, Editor, IJTK. IJTK is one of the prestigious research journals of CSIR-NISCAIR that publishes original research papers, review articles, short



Releasing the special supplementary issue of IJTK



communications, etc. concerned with the observation and experimental investigation of the biological activities of materials from plants, animals and minerals, used in the traditional health-care systems such as Ayurveda, Siddha, Yoga, Unani, Naturopathy, Homoeopathy, Folk remedies, etc.

The event concluded with a demonstration of yoga postures by a well-renowned international yoga therapist, Ms Pinki Ghanghas. She has won more than 40 medals in Yoga and represented India in many international events. She bagged the gold medal in the 5th Asian Yoga Championship held in Bangkok in 2015. She also won a gold medal in single events and silver & bronze in the artistic events in the 24th World Yoga Championship held in Malaysia in the year 2015 and a bronze medal in the 6th Asian Yoga Championship in 2016 at Vietnam.

Ms Pinki performed Surya Namaskar, which improves blood



Yoga demonstration by Ms Pinki Ghanghas

circulation in the body and enhances the solar plexus. She also performed various other asanas including Trikonasana, Paschimottanasana, Ushtrasana, Ardhamatsyendrasana, Shalvasana, Dhanur-asana, Sarvangasana, Matasyaasan, etc.

Contributed by Ms Kirti Bansal and Ms Sonam Choudhary, CSIR-NISCAIR

Honours & Awards

CSIR-NISCAIR Receives Two Prestigious First Prizes



CSIR-NISCAIR team receiving the award

CSIR-National Institute of Science Communication and Information Resources (NISCAIR), New Delhi, has been awarded two first prizes for the year 2016-2017 for best performance in implementing Rajbhasha policies among institutions under medium category and for Rajbhasha Patrika Sanchetna under the house magazine category. This was a proud moment for the institution as

this was the second year in succession that CSIR-NISCAIR won these awards.

The awards were conferred by the Town Official Language Implementation Committees (TOLICs), North Delhi, which have been constituted in various towns all through the nation for ensuring progress of implementation of Hindi language.

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