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In This Issue

"Divya Nayan" Developed by CSIR-CSIO for Visually Impaired

A text-to-speech reading machine developed for the visually impaired to help them read.

A reading device developed by the CSIR-Central Scientific Instruments Organisation (CSIO), Chandigarh, helps the visually impaired by reading the text aloud.

The advanced reading machine named "Divya Nayan" is a stand-alone, Portable Reading Machine (PRM). The PRM enables the visually impaired to read printed archives, ebooks, etc. without any third person's involvement. It is based on the principle of contact scanning of a printed document and converting it into speech. Currently, it supports English and Hindi language, but soon will be programmed for other Indian and Foreign languages.

The device is completely wireless and uses open source hardware and software, can analyse a multi-column document and provides for seamless reading to the users. It is capable of page, sentence and word-level navigation while reading, hence enabling newspaper, magazine, etc. reading effortless. The device allows the visually impaired to read the print media as well as the electronic files like eBooks.

The team of CSIO scientists has developed two different designs. In the first one, only 15 to 30 minutes are taken by the device to convert printed documents of A4 size into speech,

whereas in the second, a portable scanner is used to scan the printed document as a whole. After connecting the handy scanner to the USB, one can scan the document and listen to the recognised text using headphones.

The device has internal storage of 32 GB with a run-time of up to three hours and weighs 410 grams. It can also be connected to a monitor and used as a mini computer with screen reader utility.

For validation the prototype of the reading machine was tested at the Institute for the Blind in Sector 26, Chandigarh and Saksham, New Delhi. Feedback was also taken from the visually impaired to make it user-friendly.

Among the 39 million visually impaired across the world, India has a population of 15 million visually challenged. Existing technologies do not provide the multi-functionality as available in Divya Nayan. This portable reading machine will bridge the gap at an affordable cost for the visually impaired.

CSIR Lab Grows Kashmiri Saffron in Pune!

Saffron, widely identified with Kashmir, can now be grown in Pune as well. The CSIR-National Chemical Laboratory (NCL) based in Pune has produced a new variety of saffron crocus that can grow well in wider environmental conditions. The crop grown in a greenhouse in Pune has shown flowering almost like that in Kashmir. The new technology could benefit progressive farmers and Agri-biotech industries.

CSIR-NCL scientists studied the soil from a saffron field in Kashmir after which a suitable planting medium was formulated. Saffron corms were procured from Kashmir and planted in a modified greenhouse cooled by natural processes, without a fan, pad system or ACs. A simple irrigation method was devised to minimise the use of water and give cold/ice cold water directly to the roots.

Another challenge was to achieve production of big replacement corms which was dependent on the healthy growth of plants till end of April and production of sufficient amount of starch in the leaves, and its translocation to the developing daughter corms. In an earlier attempt, medium size replacement corms were produced. The corms once planted produce replacement corms and continue for 7-10 years; the corms from same greenhouse can be used for replanting and surplus can be sold.

After flowering, which was synchronised as in Kashmir, the stigmas were collected from the flowers and dried to produce saffron. The saffron from the CSIR-NCL greenhouse is being compared with the Kashmir saffron.

The CSIR-NCL technique could be suitable for places where the cool deficit is not too much as compared with Kashmir and can be managed by some degree of environmental control, using natural processes for cooling and some amount of freezing.

CSIR Scientists Confuse Male Bollworm to Protect Cotton Crops

Scientists at the CSIR-Indian Institute of Chemical Technology (CSIR-IICT) in Hyderabad have succeeded in denying male bollworms a chance to mate thus preventing them from multiplying in large numbers. The pink bollworm is one of the most dreaded pests that attacks the cotton crop in various States, including Telangana, Andhra Pradesh, Gujarat and Maharashtra.

The scientists used pheromones released by female bollworms to confuse the male and deny him a chance at mating. The technique, developed as part of the CSIR-IICT's Pheromone Application Technology (PAT), has proved successful in field trials and would soon be transferred to the Telangana Government to help cotton farmers in the next cultivation season.

The sex pheromone released by female pink bollworms is gossyplure, which is released into the air to attract male moths. The pheromone is part of a chemical solution put in traps in cotton fields, which ends up confusing the male

CSIR-IICT hopes to extend the PAT technique for pest management as an alternative to pesticides and genetically modified crops. The PAT technique is cost effective, with the solution, costing just Rs. 6 and the entire pheromone trap costing below Rs. 30.

The Institute has already tied up with Nuzivid Seeds for commercialisation of similar PAT techniques for various crops, apart from Gujarat Agro Industries Corporation for commercialisation of the mating disruption technique.

Cotton crop and (insect) pink bollworm

CSIR-NIIST Organises R&D-Industry Interactive Meet

Chief Minister of Kerala, Shri Pinarayi Vijayan called on scientists to forge better ties with industry to develop economically viable technologies and products for the betterment of society at a recent R&D-Industry interactive meet organised by the CSIR-National Institute for Interdisciplinary Science and Technology (CSIR-NIIST), Thiruvananthapuram.

Lamenting about the disconnect between industry and research institutions, the Chief Minister during his inaugural address said that this had hampered India's efforts to become a

major player in product development. He said, progress in science and technology was the key to industrial growth and national development and improvement in the quality of life. But it should also cater to the needs of poor people like food, sanitation, and affordable health care and ensure sustainable utilisation of natural resources.

Shri Pinarayi Vijayan remarked that many technologies developed by CSIR-NIIST had proven to be viable and popular. He called for focussed research on the scientific validation of Ayurvedic formulations. The Institute could also provide technical and consultancy support for small and medium enterprises in traditional industries and agriculture, he said.

At the meet, while Shri O. Rajagopal, MLA, called on research institutions to provide technological solutions to dispose of municipal and plastic waste, Shri Shashi Tharoor, MP, exhorted private companies to come forward to invest in research and help R&D institutions shed their dependence on government funds.

CSIR-NIO Launches Skill Development Course in Aquaculture Technology

CSIR-National Institute of Oceanography (NIO), Goa, has launched Skill Development courses in Aquaculture Technology with an aim to address the growing demand for the need of a skilled workforce and to provide employment opportunities for the youth of the country.

The Skill Development centre in Aquaculture Technology was inaugurated by Dr. S. Ayyappan, NABARD Chair Professor and the former Secretary of the Department of Agricultural Research and Education (DARE) of the Ministry of Agriculture of India and Director General of the Indian Council of Agricultural Research (ICAR).

Under the programme, it is proposed to conduct four courses initially with Job Roles/Qualification Packs: (i) Aquaculture Technician, (ii) Aquatic Microbiology Assistant, (iii) Aquaculture Worker, and (iv) Brackishwater Aquaculture Farmer.

CSIR-NIO is in the process of documentation for affiliation and accreditation with the Agriculture Skill Council of India. The central theme of the courses is Skill Development for unemployed youth with an overall objective to impart hands-on training in different fields of Aquaculture Technologies. Participants attending the courses will solve many theoretical/practical tasks during the course, and will after completion be awarded a Certificate.

The training will open up employment opportunities in the areas of Fish Breeding, Hatchery Management, Farm Technician, Hatchery Technician, Feed Technician, and Water System Technician.

The courses will cater to various sectors including government bodies such as National Fisheries Development Board (NFDB),

Marine Product Export Development Authority (MPEDA), Fisheries Survey of India (FSI), Fish Farmers Development Agencies (FFDA), Coastal Aquaculture Authority (CAA), Central Marine Fisheries Research Institute (CMFRI), State Fisheries Departments, Department of Animal Husbandry, Dairying, and Fisheries (DAHDF), Fisheries Colleges, Agriculture Research Stations, Krishi Vigyana Kendra (KVK), State Research institutions, Public Display aquariums; as well as Private Sector, Academic institutes.

The training will also open up entrepreneurship opportunities in ornamental fish culture, aquaculture, hatchery and seed production, commercial pearl oyster production, fish disease diagnostic centre, consultancy services, and establishment of aqua-clinics; and ancillary services in aqua feed preparation, fish oil antibiotic and aqua drug supply, preservation and marketing of sea products.

Sustainable utilisation of land and water resources is vital if developing countries with large populations are to ensure nutritional and livelihood security for its people. Aquaculture is currently the fastest growing food-producing sector. Today it accounts for nearly 50% of the world's food fish and is perceived as having the greatest potential to meet the growing demand for aquatic food. Given the projected population growth over the next two decades, it is estimated that at least an additional 40 million tonnes of aquatic food will be required by 2030 to maintain the current per capita consumption.

India has emerged as a major fisheries and aquaculture country in the world contributing to ~5% Agri GDP, 10% of Agri-exports and providing livelihood for 14 million people. The development of human resources, both in quality and quantity, is pivotal to sustaining the aquaculture industry in the new millennium. In the wake of globalisation, liberation & privatisation, flow of technologies has increased, fisheries & aquaculture sectors are also transforming into the industry at a faster pace.

Therefore, there is demand for knowledgeable and skilled human resource for the development of standard products and services in the sector. The skilled workforce/ human resource needs to be prepared through the Vocational Education & Training system.

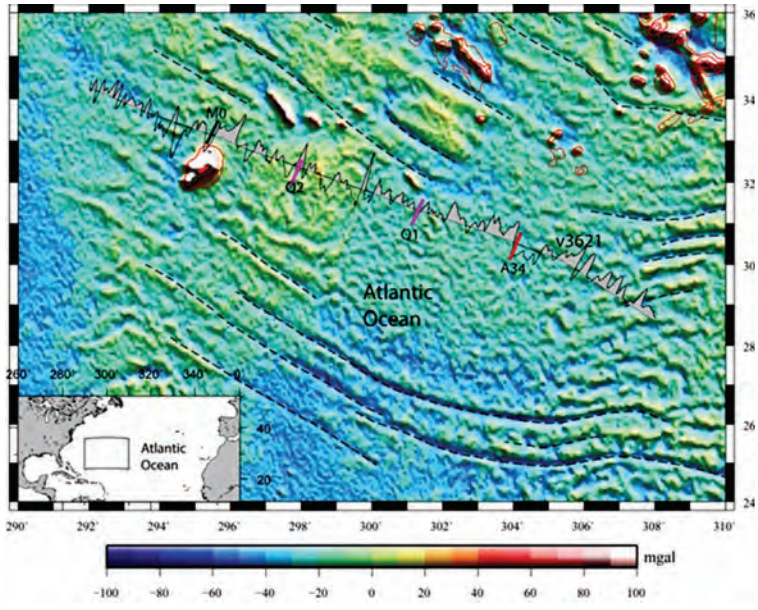
The Council of Scientific & Industrial Research (CSIR) has been contributing significantly to developing a high quality Human Resource through its academic and industry linked training programmes.

Emphasising that our country's progress and economic development are closely linked to the demographic dividend – that is, Human Resource – the Government of India has mounted a major flagship programme on "Skill Development". In tune with the Government Policy, CSIR in its Platinum Jubilee Year proposes to mount a major programme "CSIR Integrated Skill Initiative". CSIR with its 8000 highly talented S&T personnel with excellent interdisciplinary expertise, state-of-the-art facilities and pan India presence shall be in a unique position to contribute to the Government efforts.

R&D Highlights

Middle Cretaceous Geomagnetic Field Anomalies in the Eastern Indian Ocean and Their Implication to The Tectonic Evolution of the Bay of Bengal

Desa, M.; Ramana, M.V.



(http://drs.nio.org/drs handle/2264/5053)

The Middle Cretaceous period is largely known for its stable, normal polarity in the Earth's magnetic field. A few reversals (ISEA, M-3r; M-2r and M-1r) have been postulated during this period, but are yet to be accepted in total.

Recently, two anomalies Q1 (92 Ma) and Q2 (108 Ma) have been identified globally and proposed as internal time markers useful to trace the evolution of the world's oceans. While the evolutionary history of the Indian Ocean from Late Cretaceous to present is well-established, the older (Middle to Early Cretaceous) record is still ambiguous.

The occurrence of a major plate reorganisation during the Middle Cretaceous period has added to the dilemma in understanding the early evolution of the Eastern Indian Ocean. The detailed evolution of the Bay of Bengal and its conjugate Enderby Basin has remained speculative to date due to various constraints such as lack of good geophysical datasets and drill sites, and the presence of thick sedimentary load.

In the present study, an attempt is made to validate the occurrence of the Middle Cretaceous internal time markers in the Eastern Indian Ocean. These time markers are used to provide additional constraints for tracing the evolution of the Eastern Indian Ocean since Late Jurassic. Identification of these markers helped confirm the timing of spreading ridge extinction in the Perth Basin as 102 Ma.

The study suggests that excess crustal accretion occurred on the Indian plate since the Middle Cretaceous.

Relict Olivines in Micrometeorites: Precursors and Interactions in the Earth's Atmosphere

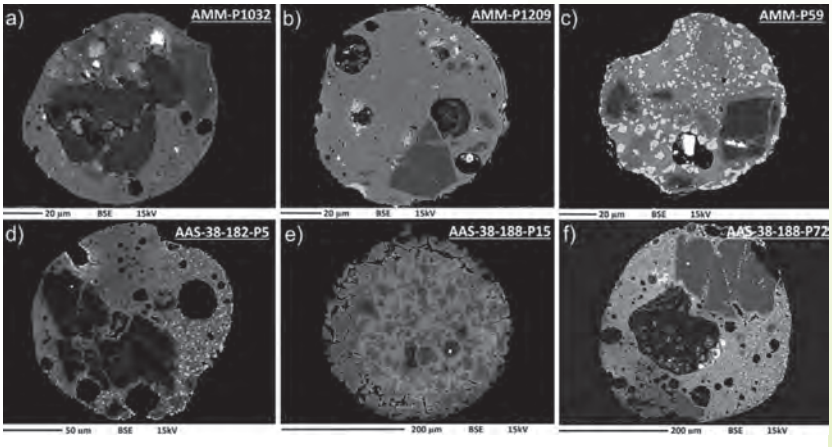
Rudraswami, N.G.; ShyamPrasad, M.; Dey, S.; Fernandes, D.; Plane, J.M.C.; Feng, W.; Taylor, S.; Carrillo-Sanchez, J.D.

Antarctica micrometeorites (~1200) and cosmic spherules (~5000) from deep sea sediments are studied using electron microscopy to identify Mg-rich olivine grains in order to determine the nature of the particle precursors.

Mg-rich olivine (FeO < 5wt%) in micrometeorites suffer insignificant chemical modification during their history and constituted a well-preserved phase. We examine 420 forsterite grains enclosed in 162 micrometeorites of different types – unmelted, scoriaceous, and porphyritic. Forsterites in micrometeorites of different types are crystallised during their formation in solar nebula; their closest analogues are chondrule components of CV-type chondrites or volatile rich CM chondrites.

The forsteritic olivines are suggested to have originated from a cluster of closely related carbonaceous asteroids that have Mg-rich olivines in the narrow range of CaO (0.1-0.3wt%), Al2O3 (0.0-0.3wt%), MnO (0.0-0.3wt%), and Cr2O3 (0.1-0.7wt%). Numerical simulations carried out with the Chemical Ablation Model (CABMOD) enable us to define the physical conditions of atmospheric entry that preserve the original compositions of the Mg-rich olivines in these particles.

The chemical compositions of relict olivines affirm the role of heating at peak temperatures and the cooling rates of the micrometeorites. This modelling approach provides a foundation for understanding the ablation of the particles and the circumstances in which the relict grains tend to survive.



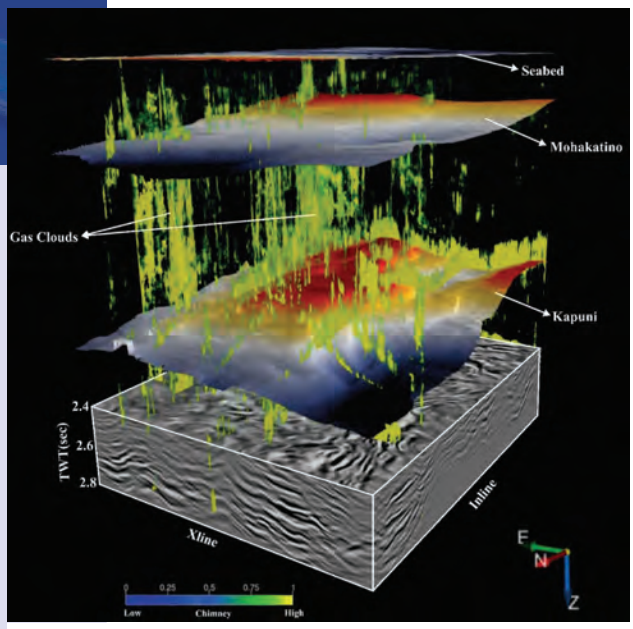
(http://drs.nio.org/drs/handle/2264/5054)

Gas clouds/Chimneys from Seismic Data using Artificial Neural Network Developed by CSIR-NGRI Scientists

We have developed a workflow based on neural network for the computation of new attribute(s) from a set of other seismic attributes that can discriminate geologic features from gas clouds or chimneys.

Application to time migrated 3D seismic data in the Maari field of highly structured and deformed Taranaki basin of New Zealand has brought out

clear gas clouds that have originated from the Late Cretaceous source rocks (Pakawau Group) and migrated into the Eocene (Kapuni Group) and Miocene (Mahakatini Group) formations (Mentioned in the figure).



(http://www.ngri.org.in/pdffiles/rh/2017/highlight_gas_chimneys.pdf)

3D visualisation of gas clouds rising from thermally matured source rock and propagating through Eocene and Miocene sandstone reservoirs to the seabed.

The study also reveals that gas has seeped through the overlying Pliocene to recent formations, the imprints of which are observed as pockmarks on the seabed.

The findings correlate reasonably with the results from Moki-1 well in the study region. This workflow can be used for interpreting plausible geological features such as faults, mud diapirs, mud volcanoes, salt bodies, slum deposits, debris flows etc. from seismic data.

Several fault intersection zones (weak zones) within the reservoirs exhibit a high probability of gas chimneys. This study acts as an add-on-tool for understanding the petroleum system and provides preventive clues for mitigating hazards in the future exploitation programme. The technique can be extended in characterising reservoir properties such as the porosity, permeability, saturation, etc.

MoUs

CSIR-CCMB signs MoUs to Develop New Drugs

The CSIR-Centre for Cellular and Molecular Biology (CSIR-CCMB), Hyderabad, has signed Memorandums of Understanding (MoUs) with four start-up firms – Oncosimis, Virupaksha Life Sciences, Theranosis and Bioartis – to develop new drugs for cancer, diabetes, diagnostic method for cancer and kits for detecting marine diseases.

After setting up the iHUB (Innovation Hub) last month at medical biotechnology complex in CCMB, the signing of MoUs with the start-up firms is regarded as the next big step towards further strengthening the collaboration between the research institute and industry.

Oncosimis is focusing on production of biosimilars and as part of the agreement signed with the research institute, the company is looking forward to developing novel processes to prepare a number of cancer drugs. Virupaksha Life Sciences expects to develop high-value peptides of clinical importance and novel molecules for diabetes. Meanwhile, Theranosis and Bioartis are planning to develop novel point-of-care devices for cancer diagnosis and kits for diagnosing marine and animal source diseases.

The iHUB set up at CSIR-CCMB is providing state-of-the-art facilities

for start-up companies who could use the facilities in "plug and play" mode. CCMB is also planning to organise several activities at iHUB, which include a scientist-industry interaction and training programmes to produce industry-ready human resource which would specifically benefit the biotech industry.

Workshops/ Training Programmes

CSIR-CBRI Awakens Scientific Temper in Young Minds

CSIR-Central Building Research Institute (CBRI), Roorkee, organised a Workshop-cum-Training Programme under the CSIR Scheme, "Faculty Training, Motivation & Adoption of Schools & Colleges by CSIR Labs", for diploma and intermediate students on 30 November 2016 to generate scientific thinking in the younger generation and create the foundation of a strong mind contributing to the development of the country.

Speaking on this occasion, Dr. R. K. Goel, Chief Scientist and Scientist-in-Charge, CSIR-CIMFR (Central Institute of Mining and Fuel Research) Regional Centre, CBRI Campus, Roorkee, enlightened the students on the requirement and importance

Lecture by Dr. R. K. Goel, Chief Scientist and Scientist-in-Charge, CSIR-CIMFR Regional Centre, CBRI Campus, Roorkee

Participants & Scientists attending the Programme

of education, goals, orientation, and training programmes. He delivered an interesting lecture on "Tunneling in Rocks" and informed about the various types of tunnels, their excavation process, equipment used, construction challenges and the key safety features during the process. He advised the students to discover their talent, develop presence of mind and work hard to achieve their dreams. Dr. R. K. Goel also motivated the students to learn from rocks and nature to discover new horizons. A science film featuring CBRI scientific innovations and success stories was also screened.

Earlier, Dr. Atul Kumar Agarwal, Senior Principal Scientist, CSIR-CBRI, Roorkee, and Programme Coordinator, welcomed the students of all schools and colleges at the inaugural function and motivated them. Emphasising on the need to awaken scientific temper through questions and interactions, he said that keenness is the key which, when turned in the right direction kicks out all the negativity and makes us the king of knowledge. He motivated the students to develop a scientific outlook and consciousness.

Dr. Atul Kumar Agarwal, Senior Principal Scientist, and Programme Coordinator welcoming the gathering

He also gave a detailed overview of the CSIR scheme of Faculty Training, Motivation & Adoption of Schools & Colleges by CSIR Labs. To spark interest among students and spread awareness about CBRI technologies and achievements, public lectures, quiz and public speaking competitions will also be organised for students.

In his Presidential Address, Dr. A. K. Minocha, Chief Scientist, CSIR-CBRI, Roorkee, enlightened the students about the research and development work being carried out at CSIR-Central Building Research Institute, Roorkee, and other laboratories of CSIR. He motivated the students to participate in the programme actively and interactively. He said that it is an honest attempt to make students aware about the contribution of CBRI scientists.

Dr. Neeraj Jain, Senior Scientist, CSIR-CBRI, Roorkee, presented an informative lecture on "Building Materials and the Impact on Environment of Ordinary Brick Kilns". He informed the students about the research and development work, innovations and the building materials and technologies developed by the institute. He also informed about the institute's efforts to solve the problem of air pollution due to high suspended particulate matter generated by ordinary brick kilns.

The participants visited the labs of CBRI including Rural Park, Organic Building Materials, Efficiency of Buildings, Plastics, Polymers and Composites, Fire

Dr. A. K. Minocha, Chief Scientist during his Presidential Address

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

Lecture by Dr. Neeraj Jain, Senior Scientist

Students visiting the Heritage & Technology Gallery

with the institute's scientists where they put their curiosity to rest and quenched their thirst for knowledge.

The programme was attended by more than 200 diploma and science students along with their faculty members from Motherhood University, Doon Public School and Shivalik Ganges Public School.

Students visiting CBRI Laboratories

Students visiting Rural Park, CSIR-CBRI, Roorkee

Students seeing Live Models of CBRI Technologies

Research, and Environmental Science & Technology-Clay Product, etc. and learned about the newest developments and technologies by the institute. They also had an interactive session

The programme got a positive feedback from the participants and ended with a vote of thanks proposed by Dr. Abha Mittal, Senior Principal Scientist, CSIR-CBRI, Roorkee.

Events

CSIR-CGCRI Hosts Indoor Zonal-III of the 48th SSBMT-2016

CSIR-Central Glass and Ceramic Research Institute (CGCRI), Kolkata, was proud to host the competitions for the Indoor Zonal-III of the 48th Shanti Swarup Bhatnagar Memorial Tournament (SSBMT) 2016, during 25-27 November 2016, which happened to be the first CSIR Sports event on the occasion of CSIR's Platinum Jubilee Year Celebrations.

Eminent football player, Shri Jo Paul Ancheri, Technical Director, Mohun Bagan Football club and AIFF (All India Football Federation) Player of the Year in 1994 & 2001, graced the occasion as Chief Guest. Shri Sundaresh of CSIR-NIO, Goa, was present as CSIR-SPB (Sports Promotion Board) Observer. Around 160 contestants from nine sister laboratories across the nation participated in the spirit of friendly rivalry.

The atmosphere was electric as the teams congregated on the lawns of the CSIR-CGCRI. The spirit of camaraderie was evident as potential rivals on the field met and greeted friends from other laboratories. A colourful march-past complete with music followed. The Flag hoisting and the oath taking ceremony were executed with befitting solemn dignity. The CSIR-SPB Flag was hoisted by the Chief Guest Shri. Jo Paul Ancheri and CGCRI-Staff Club flag was hoisted by Dr. K. Muraleedharan, Director, CSIR-CGCRI.

The contingents then assembled at the M.N. Saha Auditorium, where the ceremonial lamp was lit signifying auspicious beginnings. The Chief Guest wished all the participating teams and officially declared the tournament, OPEN.

Prior to commencement of the day's programme, however, two minutes silence was observed to honour the memory of eminent scientist Prof. M.G.K Menon, Former Director-General, CSIR (1978-1981) and legendary Carnatic Vocalist Shri Mangalampalli Balamuralikrishna.

During his Welcome Address, Dr. K. Muraleedharan said it was a pleasure to welcome the members of the sports contingents from the other laboratories of CSIR; particularly since this event dovetailed with the nationwide Platinum Jubilee celebrations of CSIR. He spoke briefly about CSIR's 75 years of journey in the service of the nation. He also highlighted a few salient points about the extraordinary achievements of Sir Shanti Swarup Bhatnagar, the Founding Father of CSIR and after whom the tournament is named.

Dr. Muraleedharan, concluded that winning or losing is a part of the game. It is not the reason behind the hosting of the tournament. Rather, the tournament is a celebration of the sportsman spirit. It is an opportunity to gather in one place, meet colleagues from far-flung areas and get to know them. This forms the basis of a strong relation which also strengthens the exchange of scientific/technical knowledge, i.e., it reinforces the motto of CSIR-SPB.

Interestingly, Chief Guest, Shri Jo Paul Ancheri did not merely declare the tournament open, but also officially inaugurated the Table Tennis (TT) venue. Much to the delight of the participants, he also, played TT with them. Chess Grandmaster Shri Surya Sekhar Ganguly, who was the Asian champion in 2009 and six-time Indian champion, was a special

Glimpses of the Indoor Zonal-III of the 48th SSBMT-2016

invitee at the inaugural session of the Chess competition. His presence greatly motivated all the participants.

The Event concluded on 27 November 2016 after a glittering Valedictory Function during which the CSIR-SPB Observer briefed the audience about his experience during the tournament. He praised the efforts of the organising team for flawless execution despite the time crunch.

The participants also shared their prized memories and expressed their appreciation for the efforts expended for the comfortable stay in Kolkata during the entire event and the exciting matches. Those SSBMT participants who were on the verge of superannuation and would not be returning for subsequent tournaments were especially felicitated.

Zonal Qualifying Teams and the winners of the different category of games (Bridge, Chess, Carom, Table Tennis, Badminton) were awarded prizes.

Shri S. Balaji, Organising Secretary, delivered the Vote of Thanks.

CSIR-NIO Celebrates its Foundation Day

On the occasion of its 51st Foundation Day, the CSIR-National Institute of Oceanography (NIO), Dona Paula remained open for public on Sunday, 1 January 2017.

The visitors enjoyed the marine aquarium that simulates coral ecosystem with its colourful fishes, models of research ships, exhibits of instruments used for oceanographic research, specimens of marine minerals rich in metals such as iron, manganese, copper, nickel, cobalt, and artefacts found by divers from ancient shipwrecks and marine archaeological sites, as well as films on ocean science, and also a public lecture on "Look to the Waters…" by an eminent scientist, Dr. S. Ayyappan, NABARD Chair Professor.

In his lecture, Dr. Ayyappan emphasised the role of fishery science and its contribution towards the Blue Economy of India. He mentioned that endowed with both marine and freshwater resources, India is a major fisheries and aquaculture country in the world, contributing nearly 5% of the AgGDP, 10% of Agri-exports and providing

livelihood for 14 million people.

He said that identification of untapped potentials, be it island fisheries, reservoir fisheries, integrated farming, sport and ornamental fisheries, each one needs to be elaborated and action plans drawn up. A ten million-tonne fish country that India is, has to focus in greater measures on aquatic resources, in order not only to produce more food, but to address the starch to protein shift, increasing pressure on land, livelihoods and equity. Given the opportunities and the partnerships, it is poised to play an important role in the Blue Economy of India.

Science Fest, Open Day, and Technical Exhibition at CSIR-CBRI

CSIR-Central Building Research Institute, Roorkee, organised a science fest, open day and technical exhibition for school children, college students, teachers, industry personnel, media and public, as a precursor event of the 2nd India International Science Festival (IISF-2016) on Thursday, 3 November

Students during the Morning Session

Students during Afternoon Session

2016 at CSIR-CBRI, Roorkee.

The programme was organised in two sessions. The morning session was attended by school children, teachers, and public, whereas the afternoon session witnessed a wide participation by college students, teachers, industry personnel, media and public.

Dr. N. Gopalakrishnan, Director CSIR-CBRI, Roorkee addressing the students

Inaugurating the forenoon session, Dr. N. Gopalakrishnan, Director, CSIR-CBRI, Roorkee, welcomed the school children and said that a calm mind is a sponge that absorbs knowledge easily. He encouraged the students to relax their mind and have an interactive and educational session with scientists and experts.

On the occasion, Prof. Dharmendra Singh, IIT Roorkee, delivered an interesting lecture on "Hidden Fun in Science" and said that we must adopt a scientific approach to our thinking process. He explained that science plays an important role in every particle, and aspect of nature, and to understand this science must not be learned, instead scientific thinking should become our habit.

In the afternoon session, Professor Gopal Ranjan presented an intriguing lecture on "Think India, Total Innovation" and encouraged the college students to bring about a new thought and build on it to create new innovations. Prof. Rajesh Chandra emphasized on the importance of questioning, curiosity, quality of life and presented an interactive lecture on important issues of "Waste Management and Sustainable Development".

Lectures by Scientists and Experts

Dr. S.C. Handa, Director, Quantum Global Campus, Roorkee presented an enlightening lecture on the "Impact of Pollution on the Taj Mahal".

As a prelude to the event, a press meet was organised on 2 November 2016 to apprise the public about the forthcoming event. Dr. N. Gopalakrishnan, Director, CSIR-CBRI, Roorkee, chaired the press meet and briefed about the programme. Press representatives from *Amar Ujala, Dainik Jagran, Hindustan, Rashtriya Sahara, Uttaranchal Deep, Awam-e-Hind, Jan Bharat Mail*, etc. attended the meet.

Earlier, Dr. A.K. Minocha, Chief Scientist and Nodal Officer, welcomed the gathering and gave an overview about the India International Science Festival (IISF) and the programme. Dr. P.K.S. Chauhan presented a formal introduction of Professor Dharmendra Singh. A film highlighting the research and development work being carried out at CSIR-Central, Building Research Institute, Roorkee, was also screened.

The programme ended with a vote of thanks proposed by Dr. Atul Kumar Agarwal, Senior Principal Scientist, and Information Officer, CSIR-CBRI, Roorkee.

Press Meet organized as prelude to the Event

The programme was attended by more than 200 college students along with faculty members from four schools and colleges of Roorkee including KLDAV (PG) College, SSDPC Girls PG College, Greenway Modern Senior Secondary School, and Children's Senior Academy.

Students visiting CSIR-CBRI Laboratories

Students learning about CSIR-CBRI Technologies

Visits

"Nation has High Expectations from Young Scientists": Dr. Harsh Vardhan at CSIR-IHBT

Dr. Harsh Vardhan, Hon'ble Union Minister for Science & Technology and Earth Science, and Vice President of Council of Scientific and Industrial Research (CSIR), visited the CSIR-Institute of Himalayan Bioresource Technology (IHBT), located at Palampur in Himachal Pradesh on 18 October 2016.

The Hon'ble Minister was shown the major research facilities and was briefed on the scientific, societal and industrial achievements of the institute. Director, CSIR-IHBT, apprised the Hon'ble Minister of the recent transfer of technologies/consultancies to various entrepreneurs and industrial partners. The Minister was also apprised of the signing of an MoU for transfer of tea, wine technology to representatives of the tea industry at Mozambique.

The Hon'ble Minister inaugurated the Pilot Plant facility for the Nutraceuticals, Academy & Technology Extension Block and Hydroponic & Aeroponic facility. The Hon'ble Minister interacted with scientists and students of the Institute. Later he also interacted with a large number of entrepreneurs and farmers who had taken technologies, advice, and consultancies from the Institute in the area of floriculture, tea, medicinal and aromatic plants, food, sweeteners, and enzymes.

He appreciated the efforts of entrepreneurs and farmers in adopting the lab technologies. The Hon'ble Minister exhorted the entrepreneurs to develop industries around local Bioresources of high commercial value. Since landholding size in Himachal Pradesh is small, farmers could form societies and approach the Institute for technical knowhow, improved cultivars. Information technology should be used for marketing of their produce, he said.

Dr. Harsh Vardhan highlighted that wide climatic diversity in the Himalayan region offers unique opportunities to develop a range of products and technologies such as low calorie sweeteners, enzymes and microbial-based products of societal and industrial significance. He advised that adoption of green technology should be preferred as far as possible. Application of nanotechnology for enhancing efficacy of bioactive compound and metabolites for effective utilisation should be rewarding.

He noted that the Himalayan region has a vast bamboo resource which should be exploited for the development of

various industrial products such as wooden board, textile yarn, activated charcoal and other industrial products.

Observing that the Himalayas are highly suitable for cultivation of high value medicinal, aromatic and other crops of commerce, he suggested that the Institute should develop a network of entrepreneurs for cultivation, processing and marketing of the produce in an organised manner. It will not only address the issue of increasing menace due to rising populations of monkeys, wild boar and ungulates in Himachal Pradesh, but will also provide higher returns to the farmers as well.

Promotion of wild marigold, damask rose, valeriana, stevia, violoa, lavender, large cardamom, *Artemisia* and rosemary by the Institute is a step in the right direction to strengthen farmers' income. Similarly, he appreciated the support given to floriculture growers in terms of improved cultivars and agrotechnology that has boosted their income by about three times. For this, the Institute should ensure supply of quality planting material to the farmers and provide scientific backup for the success of the industry.

Similarly, for tackling the current issues of labour shortage and rising cost of tea production, promotion of tea farm mechanisation and the development of value added product from tea such as high value antioxidant molecules and tea catechins, is a welcome step since the global market of catechins is expected to grow from the current value of 4400 tonnes to 9200 tonnes by 2020. Similarly, tea-based wines and ready-to-serve teas also have a global demand. He was happy to note that the Institute had promoted the ready-to-serve local cuisine '*Kangri Dham*' which is preservative-free with longer shelf life for wider marketability.

Dr. Harsh Vardhan applauded the Institute's initiative to establish a research centre in the high altitude location in the Lahaul valley to cater to the technological needs of the natives in cold desert areas of the state, and appreciated the development made in promoting floriculture industry, particularly lilium cultivation that achieved an annual turnover of Rs. 4-5 crore, by a group of 150 farmers.

The Hon'ble Minister urged the scientists of the Institute to popularise other relevant crops and use of biotechnological tools for conservation of rare, endangered and threatened plants of the Himalayas. He emphasised the need to develop skilled manpower around such technologies for sustainable utilisation of bioresources. Scientists should develop novel technologies to prevent post harvest losses of commercial crops.

The Minister also highlighted the need to develop deep scientific understanding of fundamental research for which young scientists and research scholars need to play a greater role. Bioresources in Himalayas should be used for identification of new bio-molecules of therapeutic importance, and developing crop varieties to withstand increasing biotic and abiotic stressed in the face of changing climate conditions.

He said that the nation has high expectations from young scientists who have to think out-of-the-box to take forward the national missions, and emphasised on addressing the need of the mountain communities to evolve into Samarth Bharat-Sashakt Bharat. He reminded the message of our Hon'ble Prime Minister to connect with the common people of the country through the application of science and develop people centric technologies in a time-bound manner.

Australian Consulate General Visits CSIR-NIO

Mr Tony Huber, Consulate General, Mr Tim Hall, Vice Consul, and Mr Rahul Maheshwari, Research Officer, Australian Consulate, Mumbai, visited CSIR-National Institute of Oceanography (CSIR-NIO) and held discussions with Acting Director Dr. S. Prasanna Kumar on areas of collaboration with Australia.

While welcoming the guests, Dr. Prasanna Kumar briefed them about the history and activities of the Institute and expressed the institute's interest in collaborating with Indian Ocean Rim countries.

The meeting was attended by Dr. Bishwajit Chakraborty, Chief Scientist who described his research on underwater acoustics, Mr Sanjeev Afzalpurkar, Head, Marine Instrumentation who made a presentation on the development of automated instruments for oceanographic observations, Dr. Rahul Sharma, Chief Scientist who talked about deep-sea mining, Dr. Siby Kurien, Principal Scientist and Dr. Michelle Fernandes, Research Associate who explained the activities of an Indo-Australian project on "Characterising the changing Indian Ocean's biogeochemistry and ecology using revolutionary new robotic tools".

The delegation expressed that they would convey the expertise of NIO among the research organisations in Australia in order to develop collaborative programmes in future.

Portugal PM Keen to Extend Joint Programmes in Oceanography

During the high-level delegation from Portugal led by their Prime Minister, Mr Antonio Costa to the CSIR-National Institute of Oceanography (NIO), Goa, it was agreed to extend the existing collaborative research programmes as well as to initiate new programmes in the fields of marine robotics, global navigation systems and microbial biotechnology.

The Portuguese delegation was shown the Autonomous Underwater Vehicle as well as Autonomous Vertical Profiler developed at CSIR-NIO, of which some of the control systems were designed in collaboration with the Institute for Systems and Robotic, Lisbon, Portugal. It was pointed out by CSIR-NIO Director Dr. Prasanna Kumar that the collaboration has not only resulted in developing new technologies for oceanographic research that have led to the filing of joint patents and commercialisation of the products for industrial applications, but also in offering internships to Indian students as well as conducting an annual Ocean Robotics course for engineers from various institutes in India.

Under another MoU between CSIR-NIO and Space & Earth Geodetic Analysis Laboratory (SEGAL), University of Beira Interior (UBI), Covilhã and InstitutoGeofísicoInfante D. Luíz (IDL), Lisbon signed in January 2012 a Global Navigation Satellite System (GNSS) receiver has been established in the CSIR-NIO and a sea level gauge installed at Dona Paula jetty which are being used for monitoring crustal motions in order to derive absolute or climate-related signals in mean sea level.

Joint research between the NIO and University of Azores on microbial biodiversity and biotechnology of hydrothermal vents has shown that bacterial isolates were able to tolerate the high concentration of heavy metals like Mn, Fe and Sulphur and could synthesise more than 15 enzymes which are industrially important. It is proposed that this research will be extended for molecular and mechanistic comparison on the role of gill endosymbiont bacteria in the immune responses of the deep sea hydrothermal vent mussels.

The Prime Minister of Portugal, Mr Antonio Costa highlighted the cultural and scientific exchange with India and expressed keen interest in extending the joint research programmes between the CSIR-NIO and Portuguese research institutions and assured his support in order to improve our understanding of the oceanographic processes and utilisation of its resources.

Mr Manuel Heitor, Minister of

Science, Technology and Higher Education, mentioned that "Portugal is keen on developing joint programmes with India in the field of Atmospheric and Oceanic Sciences and also to look at deep sea resources".

Following the visit of the delegation there was a meeting held with Mr Manuel Heitor, Minister of Science, Technology and Higher Education, on the details of collaborations to be undertaken under the joint programme between CSIR-NIO and research institutes in Portugal. The discussion was focussed on the exchange of scientific information and collaboration in the development of oceanographic observation system and training.

Besides the Prime Minister of Portugal and Minister of Science, Technology and Higher Education, the high level delegation comprised Ambassador of Portugal in India, Mr João da Camara, Consul General of Portugal in Goa, Mr Rui Baceira, Chief of Staff of Prime Minister, Mrs Rita Faden, President of Council of Rectors of Portuguese Universities, Mr António M. Cunha, Diplomatic Advisor Prime Minister, Mr Bernardo Lucena, Institute For Systems and Robotics, Mr Luis Sebastião.

Honours & Awards

CSIR-IICB Director Receives Prestigious Award

Prof. Samit Chattopadhyay, Director, CSIR-IICB (Indian Institute of Chemical Biology), received the Prof. S.P. Ray Chaudhuri 75th Birthday Endowment Lecture Award in November 2016. The award was conferred to Prof. Chattopadhyay by the Indian Society of Cell Biology for his outstanding research contributions in frontier areas of biology, science and human resource development in India.

Prof. Chattopadhyay has more than thirty years of research experience in different fields of biology like epigenetics in cancer, HIV biology, immunology of bacterial infection, DNA damage repair, structure-function of proteins, miRNA in cancer and other diseases, plant genetics and plant molecular biology. He has published more than eighty research papers in highly esteemed national and international journals.

Prof. Chattopadhyay is member and chairperson of many academic and research committees in various institutes in India. He has several distinguished recognitions to his credit. He is a fellow of all national academies as well as The World Academy of Sciences. Prof. Chattopadhyay is Sir J.C. Bose National Fellow and member of Guha Research Conference.

After serving NCCS, Pune for nearly fifteen years, he joined CSIR-Indian Institute of Chemical Biology (IICB) in August 2015.

COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH

HUMAN RESOURCE DEVELOPMENT GROUP

CSIR Complex, Library Avenue, Pusa
New Delhi 110 012

NOMINATIONS INVITED

CSIR Young Scientist Awards 2017

The Council of Scientific & Industrial Research (CSIR) invites nominations for the CSIR Young Scientist (YS) Awards for the year 2017. The awards are to be given for research contributions made primarily in India. The nominee should be a regular Scientist (as per CSRAP Rules) of CSIR system and should have joined the CSIR laboratory on or prior to 26 September 2016. The age of the nominee should not be **more than 35 years as on** 26 September 2016.

The YS Awards are given annually in the following disciplines: (1) Biological Sciences, (2) Chemical Sciences, (3) Earth, Atmosphere, Ocean and Planetary Sciences, (4) Engineering Sciences, and (5) Physical Sciences (including instrumentation). The YS Award comprises a citation, a cash award of Rs 50,000(Rupees fifty thousand only)*, and a plaque.

Nominations addressed to **Scientist Incharge, SSB YSA Unit, Human Resource Development (HRD) Group, CSIR Complex, Library Avenue, Pusa, New Delhi 110 012** should be sent as per the prescribed proforma (original + one copy) latest by **31 January 2017**. A CD/DVD/USB flash drive is also required containing digital photograph (in JPEG format), duly filled pro forma and significant publications (*in PDF format*) of the nominee.

The details of the YS Award and the prescribed proforma for nomination may be obtained from above address or may also be downloaded from website: www.csirhrdg.res.in

**Likely to be revised*

Nominations are invited for

Shanti Swarup Bhatnagar Prize for Science and Technology 2017

The Council of Scientific and Industrial Research (CSIR) invites nominations for the Shanti Swarup Bhatnagar (SSB) Prizes in Science and Technology for the year 2017. 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 2017 should not be more than 45 years as on 31.12.2016.

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 period on or before 31 March 2017.

Soft copy (in PDF format) of duly filled pro forma and significant publications of the nominee is also required in a USB/Pen drive. The details of the SSB Prize and the prescribed pro forma 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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