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In The News

CSIR Responds to the Chennai Tragedy

CHENNAI caved in to the onslaught of torrential rains during the last week of November 2015. The heavy and continuous downpour continued well into the first week of December marooning vast regions of the city, crippling power supplies, flooding the Chennai international airport, Egmore and Central railway stations and the Chennai Metropolitan Bus Terminus.

The city virtually ground to a halt as its major highways and arterial roads went under water burdening its citizens with untold misery and devastation.

With its impeccable track record of emergency interventions during major calamities in the country, the Council of Scientific and Industrial Research (CSIR) was once again quick to step in with much-needed help and relief.

Even though three of its Chennai-based laboratories — CSIR-CLRI, CSIR-SERC & CSIR (Madras Complex) – were also badly affected by the extensive rainfalls, teams from several CSIR labs from other parts of the country swiftly descended on the beleaguered city with support and succor.

Chennai Aerial view — massive disaster



Chennai Airport & Railway Station



Kotturpuram--400 mts away from CLRI



distribution in the surrounding areas with the help of the CLRI relief team. On the direction of DG-CSIR, CSIR laboratories (NEERI, NCL, IICT, CECRI, CSMCRI, etc.) also chipped in to facilitate the provision of clean drinking water and other relief materials to the affected people.

The very next day, 3rd December 2015, CSIR-CFTRI dispatched a container consisting of about 5 tonnes of food materials (chapathi with tomato chutney, poha, cup cakes, bun, corn flakes, water & energy drinks) and another consignment of 10 tonnes on 5th December. The food materials were distributed among those stranded in various parts of the city by teams from CSIR-CLRI and CSIR-CFTRI in close tandem with city officials. Focusing on instant energy boosting foods, CSIR-CFTRI prepared gul pavate (halwa made of wheat). Energy powder was also supplied in packs which can be consumed by just mixing in water.

On the request of the Chennai Corporation for supply of water sachets or bottles to nearly 25,000 people affected in the Adyar Zone, CSIR-CFTRI immediately dispatched water bottles, which was distributed along with food packets among the affected people in nearby old-age homes and orphanages, and even as far away as Cuddalore, which is about 170 km away from Chennai.

Flood Relief – CSIR’s Role

With the ground floor of its staff quarters inundated by water, CSIR-CLRI formed a Relief Work Team on the midnight of 30th November 2015 ensuring the safety of their staff. Not only was food prepared in the CLRI Departmental canteen supplied to people in the staff quarters, food packets were also distributed to other people affected as also the police and rescue teams in the Kotturpuram area (behind CLRI).

On 2nd December 2015, Dr. Girish Sahni, DG-CSIR directed CSIR-CFTRI to send relief food material to CSIR-CLRI for



Relief material from CSIR-CFTRI being transported to flooded areas



Among the numerous other articles distributed by the CSIR teams among the badly affected people were bed sheets, t-shirts, blankets, candles and matchboxes.

CSIR's intervention, however, does not end with provision of emergency supplies. CSIR's labs are gearing themselves up for eventualities such as spread of epidemics once the water starts to recede. This would be ensured through the supply of hygienic and nutritive food and clean drinking water. CSIR labs such as the National Environmental Engineering Research Institute (NEERI), Nagpur; the Central Salt & Marine Chemicals Research Institute (CSMCRI), Bhavnagar and the National Chemical Laboratory (NCL), Pune have already rushed indigenously-developed instant water filters for production of potable water from impure water.

The filters will be installed at locations where people can easily collect treated water for consumption. Arrangements are being made to buy tanks for storage of treated water. Once emergency measures are over CSIR plans to hand over the water filtration facility to the Corporation.

CSIR-IICT dedicated a bus for installing a unit of their indigenously developed membrane technology for water purification that can produce 1000 litres per hour to cater to the huge need of drinking water for the people in Chennai.

In the past too, CSIR institutes have responded to many natural calamities like the earthquake in Gujarat, Bihar floods, Orissa cyclone, tsunami on the eastern coast, floods in West Bengal and most recently the Uttarkashi floods in 2013.

Dr. Harsh Vardhan Appreciates Working Strategy of CSIR-IICT as a Perfect Model



Dr. Harsh Vardhan addressing the gathering

Union Minister for S&T and Earth Sciences, Dr. Harsh Vardhan, who visited the CSIR-Indian Institute of Chemical Technology (CSIR-IICT), Hyderabad appreciated the efforts of scientists of CSIR-IICT in working in diverse areas of research and formulating them into action.

Accompanied by Dr. S. Chandrasekhar, Director, CSIR-IICT and Dr. Ahmed Kamal, Outstanding Scientist, the Minister met heads of the departments of CSIR-IICT, Industry members and budding entrepreneurs. The Minister appreciated CSIR-IICT for its concerted efforts in collaboration with industries for developing successful models of technology development and deployment.

The Industry participation included representatives from Piramal Enterprises Ltd., Sigma Aldrich, Godavari Knowledge Park and BDMA, BioArtis Ltd., SAARUM, Alfa Life Sciences, AGTC Biotech Ltd, Alpha Enterprises, Stride Organics and Incogen. Some of the private sector participation was from start-up companies who have licensed CSIR-IICT's know-how, process and technology for further commercialization.

CSIR-IICT has, over the past 70 years, been instrumental in addressing numerous scientific challenges and has provided innovative solutions to problems of Indian industries in the area of drugs & pharmaceuticals, agrochemicals, biomaterials & delivery systems, polymer materials for functional coatings, biodigesters for waste management, water purification, semiochemicals, nutraceuticals, etc. The laboratory has been successful in providing integrated and total solutions from lab to commercial scale for specialty chemicals. Some of the recent success stories of the laboratory include technologies developed for hydrazine hydrate, benzaldehyde and for t-butyl toluene, anisole and their derivatives.

The Minister also met scientists of the laboratory who are turning into entrepreneurs by spinning-off technologies that include Mg-based ecofriendly rechargeable batteries, platform for enzymes technologies for pharmaceutical and agriculture applications, solar-powered hybrid air-conditioner, etc., developed by them under the start-up programme recently announced by the Prime Minister.

Dr. Harsh Vardhan expressed happiness at the focus given by CSIR-IICT under the Dehradun Declaration aiming at the GOI initiatives and lauded the R&D efforts of the laboratory under the Make in India, Smart Cities, Swasth, Swachh, Samarth and Sashakth Bharath as per the Dehradun Declaration. In appreciation of the laboratory's performance, he suggested "that this kind of a working strategy of this lab could be a perfect model to be replicated by other CSIR labs, because normally a huge gap is noticed between technological advancement and translating them for the welfare of people."

Dr. Harsh Vardhan visited the various departments of the laboratory

and urged scientists to optimally manage scientific focused activities that can be measurable leading to perceptible results in well-defined time-frames. He urged the scientific community to be more proactive, think and produce ideas, discuss and convert the ideas into the proformas of the programs initiated by the Government of India under the leadership of the Prime Minister.



Dr. Harsh Vardhan visiting the facilities at CSIR-IICT

The Minister also cautioned the scientific community on the duplication of similar work by several institutions due to lack of awareness. He emphasized that "reorientation of mind sets from casual to sincere by putting heart and soul is essential to considerably reduce the timelines for deliverables". He suggested internal brainstorming sessions along with the younger colleagues to generate a database of ideas from which a few can be picked up for developing into successful models and provide solutions to meet the needs of the country.

The Minister, while appreciating CSIR-IICT's strong connect with the public, emphasized the importance of reaching out the technologies developed to the society.

R&D Highlights

Polysilicon Piezoresistive Pressure Sensor developed by CSIR-CEERI

Pressure sensors encompass a wide application spectrum and are used in various applications such as biomedical, ocean depth measurement, and aerospace. Silicon-based pressure sensors suffer from junction leakage at higher temperature. Polysilicon-based piezoresis-

tive pressure sensors are useful for high-temperature applications as the piezoresistors are isolated from each other by an oxide layer.

Pressure sensors with different diaphragm sizes were fabricated at the CSIR-Central Electronics Research Institute (CEERI), Pilani for pressure range of 0-30 bar and the piezoresistors were placed at optimised high stress regions. This methodology allowed choosing the most suitable design with desired sensitivity and linearity after experimental evaluation. A custom made jig was fabricated and the pressure sensor die (mounted on the header) was placed inside the jig for providing the package for sensor static characterisation. This sensor arrangement for packaging is illustrated in Fig. 1. All the sensors were characterised at three different temperatures (-5 °C, 25 °C and 55 °C). The block schematic of the characterisation setup is shown in Fig. 2.

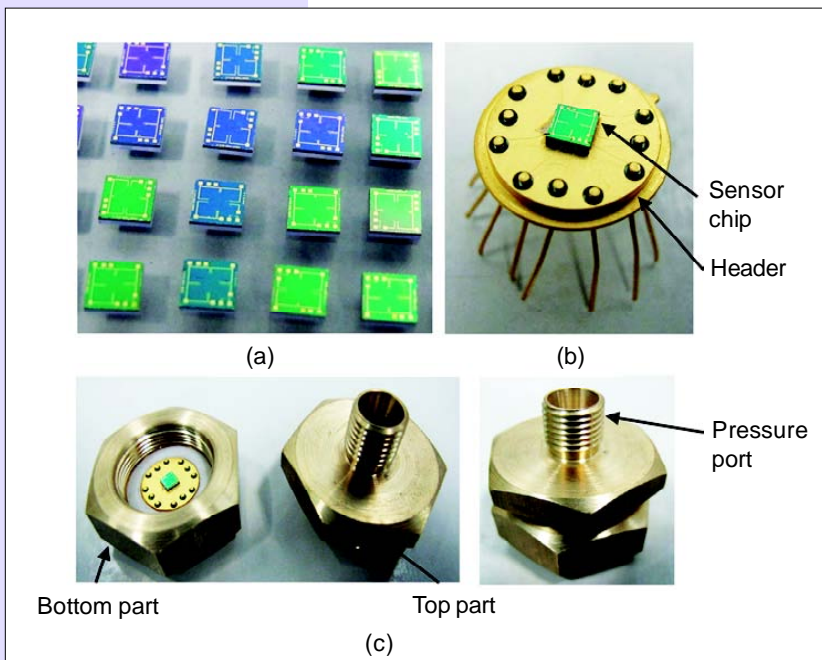
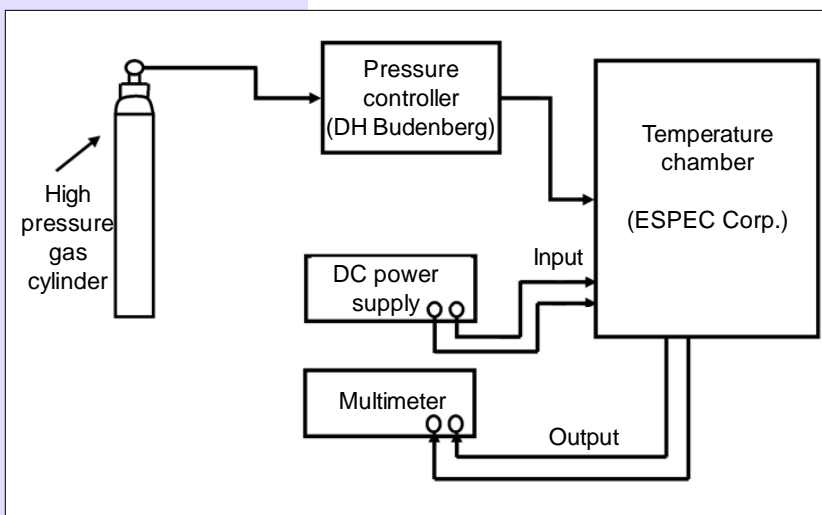


Fig. 1: Packaging of the pressure sensor
 (a) Fabricated pressure sensors
 (b) Pressure sensor chip wire bonded on header
 (c) Packaged sensor inside jig with ¼ inch pressure



Specifications	
Pressure range	: 0-30 Bar
Sensing	: Piezoresistive
Piezoresistor material	: Polysilicon
Diaphragm shape	: Square
Diaphragm edge length	: 1000-1600 µm
Characterisation	
Temperatures	: -5°C, 25°C & 55°C
Sensitivity	: 2.31-7.22 mV/Bar
Linearity	: 0.22-6.39 %/FS
Hysteresis	: < 0.1 %/FS

Fig. 2: Block diagram of pressure sensor testing setup

CSIR-CEERI comes up with MEMS Magnetometer



MEMS Magnetometer is a device that can measure the magnetic field amplitude and direction. In the current technological context, MEMS technology can be used to develop sensors that are small in size, consume low power and are easy to fabricate at low cost. The ability to detect change or variation in magnetic field opens a wide application spectrum ranging from consumer electronics to the strategic sector.

In line with the requirements of the strategic sector for navigation, CSIR-Central Electronics Research Institute (CEERI), Pilani has designed and developed MEMS-based magnetometer using wafer bonding technology.

The structure was a resonant beam fixed at its four supporting arms. SEM image of the fabricated structure is shown in Fig. 1. The resonant frequency of the device was characterised using Laser Doppler Vibrometer (Polytec MSA-500) by electrically exciting it.

Fig. 2 shows the frequency response characteristic of the device with and without the presence of magnetic field. The resonant frequency was found to be

~108 kHz from the vibration mode of the structure, as depicted in the Fig. 3.

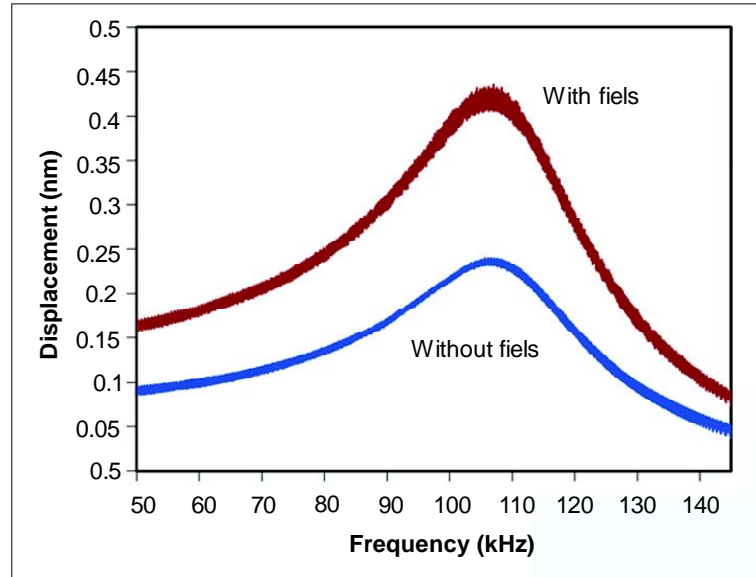


Fig. 2: Frequency response characteristics

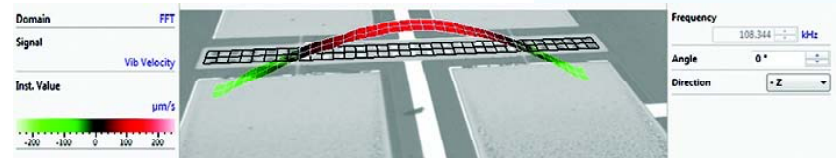


Fig. 3: Vibration mode of the device characterised using LDV

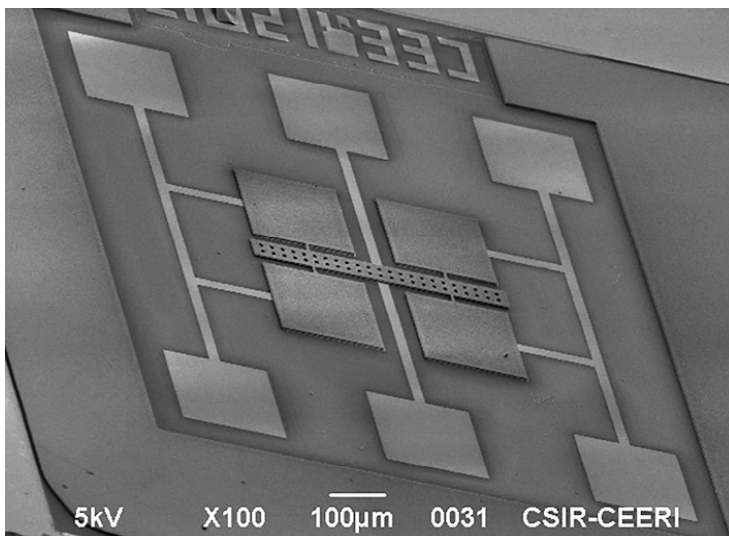


Fig. 1: SEM image of the released structure

Specifications	
Beam Length	: 496 μm
Beam Width	: 46 μm
Thickness	: 3 μm
Cavity	: 2 μm
Hole	: 8 μm x 8 μm
Chip Size	: 2.4 mm x 2.4 mm

CSIR-CEERI develops Gyroscope for MAV

Under the CSIR network project, a task to develop gyroscopes for Micro Air Vehicle (MAV) was taken up by CSIR-CEERI in collaboration with CSIR-NAL. The biggest challenge of the project was to reduce the operating voltage of the device to less than 3.3 V.

At the end of an extensive R&D activity, a two-gimbal torsional gyroscope structure was designed to overcome the limitation of current surface micromachining process, allowing it to be excited with desired voltage levels and increasing its sensitivity to angular rate. The device was fabricated by SU-8 based UV-LIGA process having 8 μm thick Ni-Fe as the key structural layer.

The SEM images of one of the fabricated devices are shown in Fig. 1. The prototype was also characterised for amplitude and phase spectral responses using Laser Doppler Vibrometer (Polytec MSA-500).

The resonance frequencies of drive and sense oscillators were observed at about 8.24 kHz and 7.76 kHz, respectively against the mode-matched design frequency of 8 kHz as shown in Fig. 2. This device can operate at less than 1 V under vacuum condition.

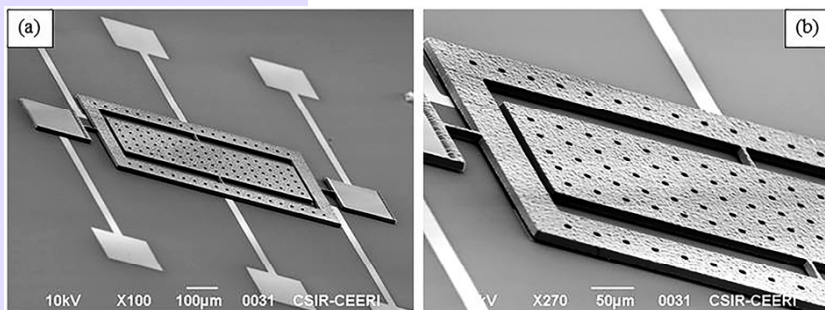


Fig. 1: (a) Complete SEM image of the fabricated device (b) Closer SEM image

Specifications

Technology	: UV-LIGA
Chip size	: 4 mm x 4 mm
Outer width of the structure	: 484.46 μm
Outer length of the structure	: 828.43 μm
Thickness of the structure	: 8 μm
Air-gap	: 3 μm
Resonance frequency	: 8 kHz
Operating voltage	: <3.3 V

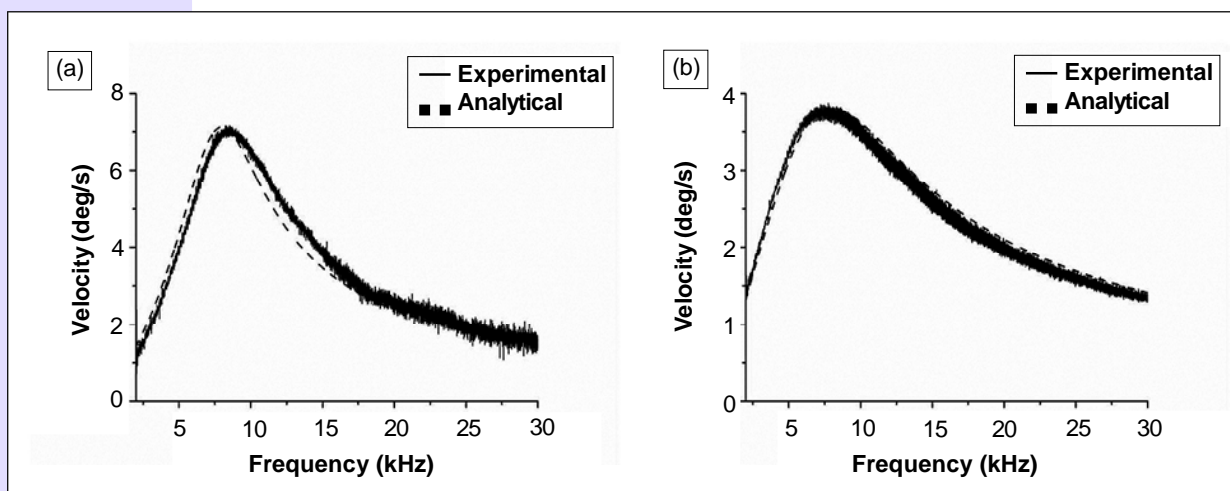


Fig. 2: (a) Frequency response of drive oscillator
(b) Frequency response of sense oscillator

Technology Transfer

NRDC Inks MoA with CSIR-IICT Hyderabad on Technology Transfer



The National Research Development Corporation (NRDC), an enterprise of the Department of Scientific & Industrial Research, Ministry of Science & Technology, Govt. of India, New Delhi has entered into a Memorandum of Agreement (MoA) with the CSIR-Indian Institute of Chemical Technology Hyderabad (CSIR-IICT) for marketing the inventions/innovations, patents, formulations, know-how/processes developed by CSIR-IICT and also collection of Premia and Royalties arising from these activities.

CSIR-IICT during its seventy year journey has made its mark as a dynamic, innovative and result oriented R&D organization in chemical and allied sciences and technology. It has emerged as a reliable destination of chemical and biotech industries and its clientele spans all corners of the globe. The research efforts during the seventy years sojourn with science has resulted in development of several innovative processes for a variety of products necessary for human welfare such as drugs, agrochemicals, food, organic intermediates, adhesives, materials etc.

In terms of research outputs, CSIR-IICT has an outstanding record in research publications, patents and technology packages. It presently occupies the top spot in

Chemical Science research in India in all such research performance metrics. The main strength of CSIR-IICT is its rich pool of scientists and PhD students numbering over 600. CSIR-IICT has active collaborations with several countries including France, Germany, UK, Switzerland, Italy, USA, Australia, Japan, Korea etc., and several students have benefitted from various exchange visit and post-doctoral opportunities.

CSIR-IICT has generated a large number of technologies, know-how/processes which can be transferred to industries for commercial exploitation and for social benefits. Under this MoA, NRDC will work with CSIR-IICT to commercialise/transfer the technologies developed by CSIR-IICT.

Chairman & Managing Director NRDC Dr. H. Purushotham announcing the MoA said that NRDC has been serving the nation for more than six decades in development, promotion and commercialisation of technologies emanating from R&D organization and academia. It has so far licensed technologies to more than 4800 entrepreneurs/companies in the country in almost all sectors of industry and provided technical and financial assistance for filing about 1700 patents in India and abroad.

Conferences**International Conference on New Horizons in Biotechnology organised by CSIR-NIIST**

The *International Conference on New Horizons in Biotechnology 2015* (NHBT-2015) was organized by the CSIR-National Institute for Interdisciplinary Science and Technology (NIIST), Thiruvananthapuram jointly with Biotech Research, India (www.brsi.in) during November 22-25, 2015 featuring the latest developments in the frontier areas of biotechnology, including industrial biotechnology, biofuels and bioenergy, agricultural biotechnology, biotechnology in diagnostics and therapeutics, biotechnology in environmental remediation and waste management at Hotel Residency Tower, Thiruvananthapuram.

The conference brought together leading scientists and technologists from industry and academics in the area of biotechnology and allied subjects to share their thoughts and views on various topics and to develop possible collaborative linkages in cutting-edge areas of biotechnology. The conference was a mega event and one of the series of such events organized every year by BRSI headquartered at CSIR-NIIST Trivandrum.

The conference was attended by about 600 delegates from across the world. The line-up of speakers consisted of international experts such as Patrick Hallenbeck from University of Montreal, Canada; Robin Anderson from the US Department of Agriculture; Mohamed Taherzadeh from University of Boras, Sweden; GR Castro from University of La-Plata, Argentina; Claude-Guilles Dussap from University Blaise Pascal, France; Michael Bott from Institute of Bio and Geo Sciences, Germany; Andres Floto from University of Cambridge, UK; DJ Lee from National Taiwan University Taiwan; Hao Huu Ngo from Australia; Christian Larroche and Philippe Michaud from Polytech Clermont Ferrand, Institut Pascal, France; Michael Herrmann from Germany, etc.

Some renowned Indian scientists who attended the Conference included CS Nautiyal from NBRI, Lucknow; Dr DB Sahoo, IBSD, Imphal; RS Sangwan, CIAB, Mohal; Javed Agrewala, IMTECH Chandigarh; S Venkata Mohan, CSIR-IICT Hyderabad; T Bhaskar, CSIR-IIP, Dehradun; Pramod Wangikar, IIT Bombay; IS Thakur, JNU, New Delhi; SN Upadhyay, BHU, Varanasi; Swaroop Sarangan, Reliance Industries Ltd, etc.

The conference was also attended by India's leading industrial R&D houses. There were 24 technical sessions, organized into three parallel sessions each day with a total of 106 invited lectures on the most advanced topics in different disciplines.

The conference was inaugurated on 22nd November at 5.30 pm in the Galaxy, Hotel Residency Tower. In his welcome address, Prof. Ashok Pandey, Chairman,



A glimpse of the opening session



Dr. A. Ajayaghosh inaugurating the Conference

NHBT-2015 mentioned that the NHBT forum, which was holding its sixth edition of four-yearly Biotechnology Conference being organized by CSIR-NIIST in collaboration with the Biotech Research Society, India has been extremely successfully in attaining its aims of disseminating the knowledge and developing networking and collaboration across the globe, not only for scientific R&D but also for industrial linkages.

In his inaugural address, Dr. Ajayaghosh, Director, CSIR-NIIST inaugurating the conference emphasised the need for need-based research, which addressed the welfare of the society at large. Dr. K. Madhavan Nampoothiri, Convener, NHBT-2015 provided the details of the scientific programme and Dr. Rajeev Sukumaran, Co-Convener provided the details of the social

programmes and general information. Subsequently, NHBT-2015 abstracts book and BRSI Yearbook 2015 were released by the dignitaries on the dais.

Prof. D.J. Lee, Chairman, IFIBiop, Prof. C.G. Dussap Charter President, IFIBiop and Prof. D. Madamwar, President, BRSI felicitated the gathering. Subsequently, the annual awards function of the BRSI was held in which awards under different categories were declared and given away by the dignitaries on the dais.



Prof. D.J. Lee addressing the delegates



Prof. Datta Madamwar addressing the delegates



Release of BRSI Yearbook 2015

interact with the top industry representatives to address their queries and concerns. This session was moderated by Dr. Narayanan Suresh, Group Editor, *Biospectrum* and had Dr. Swaroop Sarangan, Reliance Industries Ltd, Mumbai; Priyangshu M. Sarma, BT Technologies, Guwahati and Mr Mahendra Savadikar, HTBS, Pune as panellists.

There were about 400 poster presentations in three days, which covered areas including industrial biotechnology, biofuels and biorefinery, environmental biotechnology, food and agricultural biotechnology, medical biotechnology, basic and applied molecular biology and bioinformatics.

Best posters in each session received the Elsevier poster awards or BRSI poster awards. The major work presented in the conference would be published in the special issues of leading journals – *Bioresource Technology*, *Renewable Energy* and *Biologia*.

The closing session of the conference was held at 4.30 pm on 25th November 2015, in which some 425 delegates were present. Dr. Sheel Nuna, Director General (India), Queensland University of Technology, Australia was the guest of honour.

During the session, the Best paper awards (2014) for 10 top cited authors for Bioresource Technology was announced by Dr. Katherine Eve, Executive Publishing Editor, Elsevier, who also gave away the Elsevier Best Posters awards to the winners. NHBT Best Poster awards were given by Dr. Sheel Nuna and Dr. Ajayaghosh. Prof. Datta Madamwar announced IIT Mumbai as the venue for the XIII Convention of the BRSI to be held during December 8-11, 2016.

Prof. Pramod Wangikar, as the convener of the convention made a presentation on the outline and plans and



Dr. Sheel Nuna addressing the delegates in the closing session



Industry-Young Researchers Interactive session panelists (from Left) Swaroop Sarangan, Narayanan Suresh, Mahendra Vadikar and P.M. Sarma

invited the members of the Society to attend it. The conference came to a close with concluding remarks from Dr. A. Ajayaghosh and Prof. Ashok Pandey.

The conference was participated and supported by the International Forum for Industrial Bioprocesses (IFIBiop); International Organization for

Biotechnology and Bioengineering (IOBB); world's leading scientific publishing house – Elsevier, UK; Department of Science and Technology, New Delhi; Department of Biotechnology, New Delhi; Kerala State Council for Science Technology and Environment, Trivandrum; State Bank of Travancore, Trivandrum; Springer; Anchrom Enterprises (I) Pvt. Ltd., Mumbai; Biotech Express, New Delhi; Crescent Lab Equipments, Cochin; Eppendorf India Ltd; Hi-media Laboratories Pvt. Ltd., Mumbai; Inexus Biotech Pvt. Ltd., Chennai; Inkarp Instruments Pvt. Ltd.; Invitrogen Bioservices India Pvt. Ltd., Bangalore; MARS Bioanalytical Pvt. Ltd., Delhi; Reliance Industries Ltd., Mumbai; Researchco Books & Periodicals Pvt. Ltd., Delhi; Sisco Research Laboratories Pvt. Ltd., Mumbai; Thermo Fisher Scientific India Pvt. Ltd., Mumbai. Kash Biotech was the media partner for the conference.



Prof. Ashok Pandey giving the concluding remarks in the closing session

Workshops/Symposia

CSIR-IICT hosts Indo-French Seminar

The CSIR-Indian Institute of Chemical Technology (IICT) organized a four-day Indo-French seminar on *Catalysis for Green and Sustainable Chemistry*. Inaugurating the seminar on 4 November 2015, Dr. Mukesh Kumar, Director, Indo French Centre for the Promotion of Advanced Research (IFCPAR), New Delhi, enumerated the IFCPAR's role in promoting bilateral cooperation between India and France in Science & Technology.

The Indo French Centre for the Promotion of Advanced Research (IFCPAR) receives funding from the Department of Science & Technology (DST), Government of India and the Ministry of Foreign Affairs, Government

of France. As the new director of this centre, he reiterated his commitment to accelerate the growth of the Centre in promoting collaborative research between India and France in cutting edge Science and Technology with Make in India concept. A conference abstract book was also released by him on this occasion.

While Prof. S. Chandrasekaran, honorary professor, Indian Institute of Science (IISc), Bangalore presided over the function, Dr. B. Mahipal Reddy, Chief Scientist & Head of Inorganic and Physical Chemistry division at CSIR-IICT and also the Indian Coordinator welcomed the gathering and detailed about the theme of the seminar. It was

also informed that the seminar was dedicated to two most distinguished scientists from India and France, namely, Bharat Ratna Dr. A. P. J. Abdul Kalam and Nobel Laureate Prof. Yves Chauvin, who died recently.

Prof. Pierre Dixneuf, the French Coordinator explained the genesis of the seminar and the participation of experts from Industry, R&D and Academic

institutions on the chosen research topics to be deliberated at this seminar.

There were 35 lecture presentations on topics primarily focused on recent advances in catalysis science and technology for sustainable development. Development of sustainable processes is increasingly perceived as one of the most feasible ways to mitigate global warming and diversify the energy sources.



Training Programmes

Training to Tribal Women on Agarbatti-making on CSIR-CIMAP Technology

A two-day training programme on making of agarbattis (incense sticks) based on CSIR-CIMAP technology using powder of waste flowers was organised on 26 and 27 October, 2015 in village Sethumadai situated in Karmadai Forest Range, Coimbatore, Tamil Nadu. The training programme was sponsored by the Tribal Co-operative Marketing Development Federation of India Limited (TRIFED), Ministry of Tribal Affairs, Government of India. Thirty tribal (Irula tribe) women took part in the training.



Inaugural session in progress



Training session



Tribal women learning agarbatti making technique

The programme was inaugurated by Dr. T.S.K. Meenakshisundaram, Chancellor of Avinashilingam University and Chairman, Avinashilingam Jan Shikshan Sansthan (AJSS), Coimbatore. Shri V. Ramanathan, Regional Manager, TRIFED, Bangalore and Dr. T. J.

Renganathan, Vice Chairman, Shri V. Balasubramanian, Director and Smt. S. Suriyakala, Programme Officer, AJSS, Coimbatore were also present.

Dr. R.P. Bansal, Principal Scientist and Dr. A.K. Singh, Consultant, CSIR-CIMAP, Lucknow conducted the training. All the participating tribal women took keen interest in learning of agarbatti making technique through hand-rolling followed by perfuming and packaging.



A group of tribal women with packed agarbattis

TRIFED will be promoting the large scale manufacturing and marketing of agarbattis for providing additional livelihood opportunity to the tribal women besides contributing to the 'Swachh Bharat Mission' through the implementing agency Avinashilingam Jan Shikshan Sansthan (AJSS), Coimbatore.

Training for Science Teachers at CSIR-NIO

Science teachers from eight secondary and higher schools from Goa as well as Mangalore participated in the "Faculty Training and Motivation" programme conducted at CSIR-National Institute of Oceanography (CSIR-NIO), Goa from 17th to 20th November 2015. The purpose of this programme was to

re-energize teachers, expose them to different fields of Oceanography, hands-on research experience and increased knowledge about the world of oceans.

The training consisted of lecture topics such as coastal zone management, underwater cultural heritage, and latest trends in biotechnology. The programme



included demonstration of scientific equipments as well as laboratory visits including marine archeology museum with artifacts from ancient maritime equipments. The teachers took part in group discussions and also conducted mock role play on environmental issues. Researchers working in independent laboratories provided *pro bono* mentoring in diverse fields of oceanography.

The programme which is funded by the Council of Scientific and Industrial

Research (CSIR), New Delhi, is an annual outreach programme of CSIR-NIO under which 170 teachers from various schools across Goa have been trained since its inception in 2004. Dr S. W. A. Naqvi, Director, NIO congratulated the participants and awarded the certificates during the concluding session. Dr Maria Brenda L. Mascarenhas Pereira, Senior Scientist, HRM, NIO, and the coordinator of the programme proposed the vote of thanks.



Foundation Day Celebrations

CSIR-CSIO Celebrates its Foundation Day

CSIR-Central Scientific Instruments Organisation (CSIO), Chandigarh celebrated its Foundation Day on 30 October 2015. Dr. P. S. Goel, Honorary Distinguished Professor, Antriksh Bhawan, ISRO, Bangalore, and Former Secretary, Ministry of Earth Sciences, Government of India, New Delhi gave an inspiring and motivating Foundation Day Lecture entitled *I am an Engineer...Am I?*

Dr. Goel started his career initiating activity on Satellite Altitude Control System for spinning RS-1 satellite at Trivandrum and later moved to Bangalore as part of Aryabhata Project team. He was Chairman, Spacecraft System Advisory Board for IRS-1; Project Engineer, AOCS for APPLE; and Associate Project Director of INSAT-2. He was also Head, Control System Division; Group Director of AOCS; Deputy Director, Mission and Control Area; Associate Director of ISAC; and Director, ISRO Satellite Centre (1997-2005). He was also Secretary, Ministry of Earth Sciences (2005-2008), Government of India and later Chairman RAC, DRDO.



Release of Annual Report (2014-15) by Dr P.S Goel (Centre), Honorary Distinguished Professor, ISRO, Bangalore on the occasion of CSIR-CSIO Foundation Day. Other dignitaries are Prof. R K Sinha, Director, CSIR-CSIO (Left) and Dr. C. Ghanshyam (Right), Chief Scientist, CSIR-CSIO, Chandigarh

In the CSIO Foundation Day lecture, Dr. Goel stressed that engineering is not just a degree, not just a means of problem solving or just doing research, but it involves all the above leading to finding solutions to problems that exist, and that do not seem to exist. He said that engineering is about changing life, its

perception and its meaning and is a way of life, it reflects in every day actions. It may or may not result in big changes; but it is a mindset “to change”. He emphasized that there is a need to create the mind of an engineer in engineering education, not a job seeker with high remuneration. He encouraged the participants by saying that, “There is a magician in you, wake it up and let it free to show a trick or two, to the world.”

Later, Dr. P.S. Goel also released the annual report of CSIR-CSIO 2014-15.

Prof. R.K. Sinha, Director, CSIR-CSIO while welcoming the Chief Guest highlighted the aims and goals of CSIO and its contribution in the field of Science and Technology. Prof. Sinha also presented an overview of the on-going projects and future plans of the

organisation. While releasing the ‘Annual Report’ of CSIO he said that the laboratory has traversed a long journey and is celebrating its 56th Foundation Day. He also informed about new heights achieved in Head-up Display technology and the plans to make variants for different types of aircrafts. He talked about the development being carried out in the areas of Agrionics, Biomedical instrumentation. Prof. Sinha thanked the industry for coming forward to take the technologies from CSIO like Electrostatic Sprayer and Electronic Stethoscope this year.

The function concluded with a formal vote of thanks by Dr. C. Ghanshyam, Chief Scientist, CSIR-CSIO, Chandigarh.

CSIR-IIIM Celebrates Foundation Day

The CSIR-Indian Institute of Integrative Medicine (IIIM), Jammu celebrated its 58th Foundation Day on 1 December 2015. The Laboratory was established in 1941 as a research and production centre, known as the Drug Research Laboratory of J&K State and was later taken over by the Council of Scientific & Industrial Research (CSIR) of the Govt. of India

on 1st December 1957 and re-named Regional Research Laboratory, Jammu. In view of its core strength in natural products based drug discovery, the mandate of the Institute was redefined in 2005 and its name was changed to the Indian Institute of Integrative Medicine (IIIM).

A simple and impressive function was organized in the IIIM auditorium to celebrate the IIIM Foundation Day. Prof. Shannon B. Olsson, a distinguished faculty member of the National Centre for Biological Sciences (NCBS), Bangalore, was the chief guest of the function. She delivered the Foundation Day lecture entitled, *Naturalist-Inspired Chemical Ecology*.

In her lecture, Prof. Shannon explained that a century ago, our understanding of nature was dominated by naturalists but today we can assess and manipulate living systems at the genetic,



molecular and physiological levels. She hypothesized that by uniting these modern scientific techniques with natural observations, we can truly understand these biological processes in the context of the natural world where the chemical ecology is the ideal forum to create the modern naturalist.

Prof. Shannon also stated that Chemical Ecology is a vast and highly interdisciplinary field, incorporating everything from proteomics to molecular biology to neuroscience. Her research focused on comparative approach to understand how animals parse the complex natural chemical environment to generate decisions.

Earlier, Dr. Ram Vishwakarma, Director, IIIM Jammu, introduced Prof. Shannon B. Olsson as a leading scientist of international repute who at NCBS is involved in setting up NICE: Naturalist Inspired Chemical Ecology, which of

fers a multidisciplinary approach spanning chemistry, neuroethology, evolutionary biology, animal behavior and engineering.

On this occasion, students from different colleges and schools in the city were taken on a guided visit to the various research divisions and medicinal fields of the institute. The Scientists and Technical staff demonstrated their indoor and field research activities to the visitors.

Mr Abdul Rahim, Head PME presented the vote of thanks and Ms Neelam Sharma conducted the proceedings.

Later in the evening, a colourful cultural programme was also performed by the children of RRL High School and research scholars of IIIM.



CSIR-NBRI Celebrates 62nd Annual Day

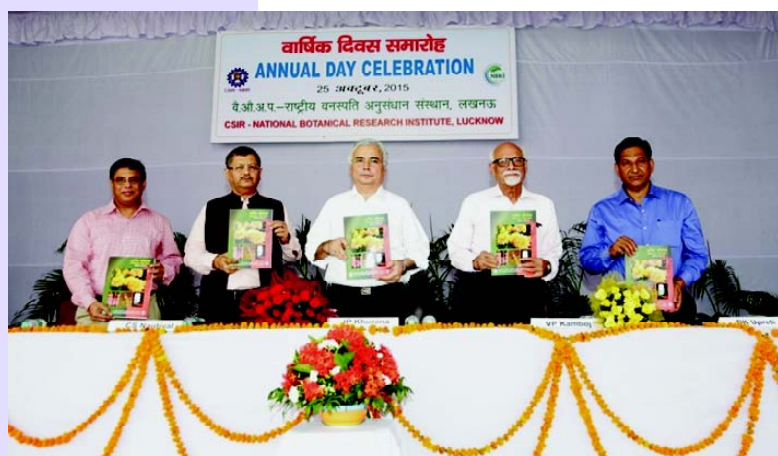
The CSIR-National Botanical Research Institute (NBRI), Lucknow celebrated its 62nd Annual Day on 25 October 2015. Prof. J.P. Khurana, Delhi University South Campus, New Delhi was the Chief Guest while Dr. V.P. Kamboj, Former Director, CSIR-Central Drug Research Institute, Lucknow, was the Guest of Honour on this occasion.

Dr. C.S. Nautiyal, Director of CSIR-NBRI welcomed the guests and presented the annual report of the Institute for the period 2014-15. Dr. Nautiyal informed about the various activities and achievements of the Institute during the last one year.

Prof. J.P. Khurana in his Annual Day lecture *A molecular framework of light control of plant development*, discussed the importance of light in the life of plants and its role in regulating various developmental phases of plant life, including seed germination, plant growth including plant height and flowering. He elucidated the role of phytochromes and cryptochromes in the complex molecular framework involved in light signalling. He emphasised that this intricate network of light signalling components interact with all the important pathways which regulate expression of various genes that eventually regulate plant responses. Leveraging this knowledge will help unravel the as yet unresolved mechanisms of light signalling and responses in plant systems, he concluded.

Dr. V.P. Kamboj in his presidential address complimented NBRI for its efforts and achievements, especially in utilizing the natural resources through modern scientific technology and providing its benefits to the society. He urged the need to develop agrotechnologies for various plants being used for the manufacturing of various plant-based products, so that high quality material can be made available to the industry. He emphasised the role of farmers in the selection and breeding of various crops through their traditional knowledge and practices.

On this occasion, the Annual Report, Annual Hindi Magazine (*Vigyanvani*) and a book on Bougainvillea were released by the dignitaries. A new variety of Bougainvillea, named “APJ Abdul Kalam”, developed by CSIR-NBRI, was also released. The occasion was also marked by the launching of an anti-diabetic herbal product ‘BGR-34’, developed jointly by CSIR-NBRI and



Release of the CSIR-NBRI Annual Report 2014-15



Release of the Annual Hindi Magazine “Vigyanvani”

CSIR-CIMAP, for commercial manufacturing and marketing by M/s Aimil Pharmaceuticals Pvt Ltd, New Delhi.

Scientists and students of the Institute, who have published their

research work in journals with high impact factors, were felicitated on this occasion. Dr. D.K. Upreti, Chief Scientist proposed the vote of thanks.



Launching the anti-diabetic herbal product 'BGR-34', developed jointly by CSIR-NBRI and CSIR-CIMAP, for commercial manufacturing and marketing by M/s Aimil Pharmaceuticals Pvt Ltd, New Delhi



Release of a new variety of Bougainvillea, named "APJ Abdul Kalam", developed by CSIR-NBRI

Events

Shramdhan-2015 at CSIR-CECRI

Every year, on Gandhi Jayanthi, the CSIR-CECRI Club, Karaikudi organizes a Shramdhan. This year, under the guidance of Dr. M. Jayachandran, Chief Scientist, CSIR-CECRI, a large number of CECRI staff and their family members, students and teachers from Kendriya Vidyalaya and volunteers participated actively.

Dr. Jayachandran called upon the audience to strive for societal causes. He stressed on the need for a cleaner and greener nation. He said that Parents and Teachers should sow the seeds of social responsibility and inculcate the habit of cleanliness among the younger generation.



Dr. Jayachandran paying homage to the Father of the Nation

Later, he administered the 'Swachh Bharat' oath to the audience. There was a procession of students and teachers with

slogans on the importance of greenery and cleanliness. Many saplings were also planted in the campus.



Cleaning in progress



Sapling plantation

Honours & Awards

CSIR-IICB Scientist Selected Associate Editor of Royal Society of Chemistry Journal

Dr. Surajit Ghosh, Principal Scientist, CSIR-Indian Institute of Chemical Biology, Kolkata, has been selected as Associate Editor in the prestigious Royal Society of Chemistry Journal *RSC Advances*.



Medicinal Chemistry. At CSIR-IICB, his group is working in the interface of chemistry and biology with a focus on developing small molecule and peptide based anti-Alzheimer's and anti-cancer therapeutics. Dr. Ghosh

After completing his MSc in Organic Chemistry in 2000, Dr. Ghosh moved to Syngene International Pvt. Ltd (Biocon Group) and worked as a Scientist till July 2004. Subsequently, he moved to the Indian Institute of Technology, Kanpur in 2004 for his doctoral studies in the area of Peptide Self-assembly and on completion of his PhD thesis work in 2008, he joined as postdoctoral fellow at the European Molecular Biology Laboratory, Heidelberg, Germany with Dr. Thomas Surrey, where he worked on organization of microtubule and molecular motor proteins till December 2010.

Dr. Ghosh joined CSIR-IICB in 2011 in the Department of Organic and

and his group have already developed a few peptides which show significant neuroprotection and currently they are trying to develop more potential molecules in this field. His group has made some advances in developing small molecule and peptide based anticancer therapeutics and trying to develop various platforms using surface modification techniques for studying protein-protein interactions, mechanism of intracellular cargo transport and targeted drug delivery.

He is a recipient of BASF and DBT Wellcome Trust Travel grant award, BIOCON Tribute award, EMBL Postdoctoral Fellowship, Alexander von Humboldt Fellowship and Ramanujan Fellowship.

He has a number of recent publications in high esteemed international journals like *Chemical Communication*, *ACS Chemical Neuroscience*, *Dalton Transactions*, *Soft Matter*, *Macromol Biosci.*, *RSC Adv.*, *ChemBioChem* etc. and among them five works have been highlighted on the cover

of the journals. His contribution at CSIR-IICB in the last four and half years has been recognized by various national and international scientific communities and received invitations for delivering talks at various national and international conferences.



CDRI Awards 2015

The prestigious CDRI Award 2015 for Excellence in Drug Research in Life Sciences category has been awarded to Prof. Rinti Banerjee, IIT Bombay for her work on “Trigger Responsive Nanoparticles for Drug Delivery”.

In the Chemical Sciences category, the award has gone to Dr. Ramakoteswara Rao Jetti, Mylan Laboratories, Hyderabad for his work on “Novel Solid Forms of Active Pharmaceutical Ingredients”.

CSIR-IICT Scientist Nominated to Telangana State Pollution Control Appellate Authority

Dr. V. Jayathirtha Rao, Chief Scientist, Crop Protection Chemicals Division, CSIR-Indian Institute of Chemical Technology has been nominated by the Govt. of Telangana, as member, Telangana State Pollution Control Appellate Authority.

Dr. Rao will have to deliberate on appeals against the orders of the Telangana State Pollution Control Board under the provisions of the Pollution Control Board Acts. His tenure is for a term of two years.



CSIR-IICT Scientist wins Innovation Award

Dr. J. Vatsala Rani, Senior Scientist, Fluoroorganics Division, CSIR-Indian Institute of Chemical Technology has won the top 30 “Innovator’s Competition” for DST-Lockheed Martin India Innovation Growth Programme 2015 for her innovation titled “Futuristic eco-friendly rechargeable Mg battery”.

As part of this programme, she would be sponsored for a visit to Silicon Valley and Stanford School of Business, California, USA. The innovation is also part of the 10 innovations selected by IC2 Institute, University of Texas at Austin, USA for commercialization.



COUNCIL OF SCIENTIFIC AND INDUSTRIAL RESEARCH

HUMAN RESOURCE DEVELOPMENT GROUP
CSIR Complex, Library Avenue, Pusa, New Delhi 110 012

NOMINATIONS INVITED

2016 CSIR Young Scientist Awards

The Council of Scientific & Industrial Research (CSIR) invites nominations for the CSIR Young Scientist (YS) Awards for the year 2016. The awards are to be given for research contributions made primarily in India.

The nominee should be a regular scientific staff of CSIR system holding a post of Junior/Trainee Scientist or above (Previously Scientist 'B' or above in Group IV) and should have joined the CSIR laboratory on or prior to 26th September 2015. The age of the nominee should not be **more than 35 years as on 26th September 2015**.

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 **31st January 2016**. A CD/DVD/USB flash drive is also required containing digital photograph (in JPEG format), duly filled proforma 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 the above address or may also be downloaded from the website: www.csirhrdg.res.in

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Phone: 25848702; Fax: 25847062; E-mail: csirnews@niscair.res.in; hjk@niscair.res.in

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

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