



CSIR - CGCRI

NEWS LETTER



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FOCUS

Dr K Muraleedharan takes over as Director

Dr Kuttanellore Muraleedharan assumed charge as Director of CSIR-Central Glass & Ceramic Research Institute on August 5, 2016. He is the eight scientist in the long history of CSIR-CGCRI to have taken over as Director.



Dr K Muraleedharan at his desk

Dr Muraleedharan obtained BTech (1983) and PhD (1994) from Banaras Hindu University-Institute of Technology (BHU-IT), Varanasi. He joined Defence Metallurgical Research Laboratory (DMRL), Hyderabad as a Scientist in the year 1984 after a short tenure as Graduate Engineer Trainee at the Mishra Dhatu Nigam (MIDHANI), Hyderabad. Dr Muraleedharan worked as a Research Associate at the Carnegie Mellon University (CMU), Pittsburgh, USA during 1995-1997. He headed the Electron Microscopy Division at DMRL during 1989-2010 and was the project leader of the project entitled 'Science and Design of Materials at Atomic Scale' during 1999-2004. It was under his able leadership that the electron microscopy facility at DMRL elevated to international standards. Later, he became the leader of a project for the 'Development of Specialty Steels for Naval Applications'. The team led by him developed various steel products for use in the warship construction for Indian Navy. Thanks to their efforts, Indian Navy need not import any steel for warship construction. The range of products indigenised were wide plates, bulb-bars, weld consumables, forgings, castings etc. The country's first Aircraft Carrier, INS Vikrant II, commissioned recently was built by these steels.

Dr Muraleedharan has also been the member of DRDO Think Tank during 2003-2005. He rose to the level of Director of Materials, DRDO, New Delhi in

2011 where he coordinated the NBC Defence and the Nano Science & Technology activities as well as the activities of Materials Cluster laboratories. He was later the Director Technical (Materials), Technical Core Group at DRDO Head Quarters (2013-15) and provided advice and insights into materials related activities of DRDO before he assumed the present position.

He has received many awards and recognitions. Some of the recent ones are: Two DRDO Agni Award in 2005 for the 'Development of Complete Ore-Product Cycle for Titanium' and again in 2007 for the 'Development of Specialty Nava Steels'; Eminent Engineering Personality by the Institution of Engineers in 2012; The Distinguished Alumni Award from the Department of Metallurgical Engineering, BHU, Varanasi in 2013.

Dr Muraleedharan's research interest includes the Science and Design of Advanced Materials and Multi-scale Microstructural Characterization using techniques such as Transmission Electron Microscopy and 3D Atom Probe Field Ion Microscopy, as applied to the study of electronic materials and solid-state phase transformations. His research at DMRL and CMU concentrated on the Process-Structure-Property relationships in a variety of materials systems such as alloys based on Ti and its intermetallics Ti₃Al and TiAl; Specialty steels; Ni base superalloys; High energy rare-earth permanent magnets; and ceramic matrix composites. Dr Muraleedharan is a member of many professional bodies and has been the Vice President (2011-2013) and President (2013-2015) of the Electron Microscopy Society of India (EMSI) and is currently National Council member of Indian Institute of Metals, Indian Ceramic Society and EMSI.

TECHNOLOGY NEWS

CSIR-CGCRI Bags Technology Award for Third Time

CSIR-CGCRI received the CSIR Technology Award for 2015 for 'Completely



The team CSIR-CGCRI receiving Technology Award. Seen in the middle are Hon'ble Union Minister of Science & Technology and Earth Sciences, Dr Harsh Vardhan (right) and Mr Y S Chowdary (Left), Hon'ble Minister of State for Science & Technology and Earth Sciences

Packaged All-Fiber Supercontinuum Light Source' in the innovation category. The product, Confocal Microscopy, out of this technology was launched by Dr Jitendra Singh, the then Union Minister of Science & Technology and Earth Sciences and Vice-President, CSIR on October 7, 2014. It was developed in a Public-Private Partnership (PPP) mode under a CSIR-NMITLI project in collaboration with industry partner M/s Vinvish Technologies Pvt Ltd, Thiruvananthapuram.

The industry has received 4 number of orders for supercontinuum source so far. It is the third time in recent years that CSIR-CGCRI has won the Technology Award. A team comprising of scientists Dr SK Bhadra, Dr MC Paul and Dr Mrinmay Pal received the coveted Award on September 26, 2015 at the CSIR Foundation Day Celebrations in New Delhi. Besides these scientists the other members in the team were Mr/s Tapan Dasgupta, Nabakumar Das, Pratik Ghosh and Abhirup Biswas who provided technical support to the project.

SEMINAR

National

Advances in Refractory Raw Materials and Monolithics (ARMM 2015; November 19, 2015)

The seminar was jointly organized with Kerneos Aluminate Technologies at CSIR-CGCRI. The refractories today demand stringent quality requirements from big steel producers. High quality of finished refractory depends on high grade refractory raw materials. This is presently met through synthetic raw materials. Since the availability of good quality refractory is scarce, the challenge lies with gainful utilization of abundantly available natural resources through suitable technological interventions. The seminar focused on the challenges and technological interventions that have taken place in refractory raw material and monolithic refractory. The topics covered were: Beneficiation or Value addition to natural raw materials, Synthetic refractory raw materials, Refractory castable and binder systems, Challenges and opportunities and Quality control. There were three technical sessions and three lectures were delivered in each session. Eminent speakers from industry and academia spoke on this occasion. In all there were 79 delegates.

Dr J N Tiwari, Executive Director, OCL India Ltd & Chairman, IRMA graced the occasion as Chief Guest while Dr Christoph Wohrmeyer, Senior Technical Director, Kerneos delivered the Key Note Address. Mr Segi P Idicula, Managing Director, Kerneos India and Patron ARMM 2015 spoke on the theme of the seminar.



Dr Muraleedharan giving his welcome address

Internal

4th Research Scholars' Day (4th RSD; September 18, 2015)

The 4th RSD was held at CSIR-CGCRI. The Chief Guest on this occasion was Prof Arup K Roy Choudhury, Emeritus Scientist, Satyen Bose National Centre for Basic Sciences, Kolkata. There has been a spurt in the number of research students at CSIR-CGCRI since past few years and obviously the number of presentation rose this year to 76. There were 12 oral presentations and the rest were all posters. The orals were presented by the senior research students who have spend at least three years in the Institute. The Chief Guest Prof Roy Choudhury delivered a lecture entitled "The Joy of doing Materials Science". The lecture was well received. The best presentations in the three major categories: Functional Glasses & Coatings, Functional Ceramics and Engineering Ceramics were awarded prizes. The winners in different categories are as follows:

a) Functional Glass & Coating:

Oral:

1. Manish K Mishra – Nanostructured Materials Division (St/O Dr Goutam De)

Posters:

1. Gaurav Gupta – Glass Division (St/O Dr K Annapurna)
2. Debarati Ghosh – Glass Division (St/O Dr K Annapurna)
3. Nilanjana Sasmal – Glass Division (St/O Dr B Karmakar)
4. Indranee Das – Nanostructured Materials Division (St/O Dr Goutam De)
5. Subir Majumdar – Fibre Optics and Photonics Division (St/O Dr S K Bhadra)

b) Functional Ceramics:

Oral:

1. Ujjal Choudhury – Nanostructured Materials Division (St/O Dr Dipten Bhattacharya)

Posters:

1. Sourav Ghosh – Sol-gel Division (St/O Dr Milan K Naskar)
2. Sayantan Ray – Bioceramic & Coating Division (St/O Dr Jui Chakraborty)
3. Rajashree Konar – Fuel Cell & Battery Division (St/O Dr R N Basu)
4. Sumita Das – Sensor & Actuator Division (St/O Dr P Sujatha Devi)
5. Sambhu Nath Maity – Fuel Cell & Battery Division (St/O Dr R N Basu)

c) Engineering & Structural Ceramics:

Oral:

1. Mita Biswas – Non-Oxide Ceramic Division (St/O Dr S Bandyopadhyay)

Posters:

1. Ankita Bose – Ceramic Membrane Division (St/O Dr Nandini Das)
2. Subhas Chandra Mohanta – Sensor & Actuator Division (St/O Dr P Sujatha Devi)
3. Akriti Anand – Bioceramic & Coating Division (St/O Dr Biswanath Kundu)
4. Itishree Ratha – Bioceramic & Coating Division (St/O Dr Biswanath Kundu)
5. Mostafa Shamim – Refractory & Traditional Ceramics Division (St/O Dr Kaushik Dana)



Prof Arup K Roy Choudhury delivering lecture at CSIR-CGCRI

IMPORTANT EVENTS

Visit of DG, CSIR

On August 11, 2015, Dr M O Garg, the then Director General, CSIR, visited CSIR-CGCRI. He held discussions on several issues of R&D and technology management with the senior level scientists of the Institute. He also addressed all the scientists. He reiterated the need to work in mission modes as per the Dehradun Declaration for inclusive growth and development of nation.



Dr M O Garg, DG, CSIR interacting with scientists

Hindi Fortnight Organized

Hindi fortnight was organized at Institute from September 1-15, 2015. The Chief Guest Mr Ashok Bajpeyi, an eminent writer delivered the 3rd Diamond Jubilee Lecture entitled "Sahitya Ki Zaroorat" in official language while noted Bengali novelist Mr Sirshendu Mukhopadhyay presided over the function. Prizes were given to the winners of various competitions held in view of the said programme.



September 15, 2015: The concluding function

12th Atma Ram Memorial Lecture

Padma Shri Dr G Sundararajan, Director, International Advanced Research Centre for Powder Metallurgy and New Materials (ARCI), Hyderabad and Professor, Department of Metallurgical & Materials Engineering, IIT-Madras delivered the 12th Atma Ram Memorial Lecture on August 26, 2015 at CSIR-CGCRI. The title of his lecture was "Advanced Ceramics: Research & Technology Development at ARCI". He spoke on novel ceramic materials and innovative processing technologies that have been either developed by ARCI or are under development. He informed that ARCI is currently also engaged in the development of transparent polycrystalline sub micron alumina, aluminium oxynitride, spinel and zinc sulphide (ZnS) ceramics. In of his talk, he outlined the challenges of research in different areas followed by the outcomes. He was presented with a silver plaque after lecture. He also held discussions with senior level scientists on few strategic sector projects currently under progress at the Institute.



Dr Muraleedharan awarding silver plaque to Dr Sundararajan after lecture

73rd CSIR Foundation Day Lecture

Dr Satish Kumar, Distinguished Scientist and Director General (Missiles & Strategic Systems), Defence Research Development Organization (DRDO), New Delhi graced the 73rd CSIR Foundation Day as the Chief Guest on September 26, 2015.

In his lecture entitled "Techno-Managerial Challenges in R&D Organization" he appreciated CSIR-CGCRI for its significant contributions to the strategic, industrial and societal sectors. He said that the Institute has made significant contributions to the strategic sector and can expand its role if it focuses more on the issues related to materials development in DRDO establishments. Dr Satish Kumar said that CSIR-CGCRI could become one of the vibrant work centres of DRDO and pointed to high end areas of mutual interest.

On this occasion 17 retirees were felicitated with shawl and certificate of merit and equal number of staff were presented with wrist watches in view of their completion of 25 years of service in CSIR. A daughter of a staff was awarded for academic excellence in CISCE exam. About 100 students from



Dr Satish Kumar delivering 73rd CSIR Foundation Day Lecture

city's schools visited the Institute under open day programme. A cultural programme of dance, music and audio drama was also staged in which the staff members performed.



The participants of cultural programme

Inaugural Dr APJ Abdul Kalam Lecture

Prof Amitabha Ghosh, Former Director, Indian Institute of Technology, Kharagpur and Honorary Distinguished Professor, Indian Institute of Engineering Science and Technology, Shibpur delivered on October 15, 2015 this inaugural lecture. The topic of his lecture was "Ancient India and Aryan Invasion Hypothesis: Results of the Recent Scientific Investigations". On this occasion, Former Directors of CSIR-CGCRI, Dr B K Sarkar who had worked closely with Dr Kalam in ISRO and Dr H S Maiti narrated their reminiscences and views on Dr Kalam. Besides them Prof T K Ghosal and



AWARDS & HONOURS

Professional Awards

1. Dr K Muraleedharan, Director, CSIR-CGCRI

(i) Co-opted as a member of the National Council of Indian Ceramic Society, 2015-2017 and National Council Member of Indian Institute of Metals, 2015-2017.

(ii) Received the Laboratory Award for Best Technical Paper from Defence Metallurgical Research Laboratory, Hyderabad on October 16, 2015 along with R Veerababu, R Balamuralikrishnan and M Srinivas for the paper entitled 'Investigation of Clusters in Medium Carbon Secondary Hardening

Ultra High Strength Steel after Hardening and Ageing Treatments' published in Metallurgical and Materials Transactions A, 46A(2015), 2455-68.

2. Dr R N Basu, Chief Scientist and Head, Fuel Cell and Battery Division re-elected as the Secretary of the West Bengal Academy of Science & Technology for the period of 2015-17.

3. Dr P Sujatha Devi, Principal Scientist & Head, Sensor & Actuator Division elected as the Editor of the Transactions of the Indian Ceramic Society.

4. Ganesh C Sahoo, Biswajit Roy, Surajit Dey, Swachchha Majumdar, Somendra Nath Roy and Sibdas Bandyopadhyay, Ceramic Membrane Division, received RBGV Swaika Memorial Award (Team award for applied research) at the 70th Annual Convention of Oil Technologists' Association of India (OTAI) held at CSIR-CGCRI, Kolkata during November 21-22, 2015 for their work on 'Technology Development for Refining of Rice Bran Oil Miscella using Ceramic Microfiltration Membrane'.

Poster Award

Indranee Das, Goutam De, Leena Hupa and Pekka K Vallittu of Nanostructured Materials Division received the Best Poster Award for their paper entitled "Bioactive Glass-Ceramic Coating Grafted with Porous SiO₂ Nanofibers: A Structural Scaffold for Uniform Apatite Formation and Oriented Cell Proliferation on Inert Implant" in the 6th MRS Trilateral Symposium on 'Advances in Nanomaterials: Energy, Water and Health care' held at Institute of Nano Science and Technology, Mohali, Punjab during November 23-25, 2015.

Prestigious Fellowship

Ms Sangita Kundu, Junior Research Fellow, Nanostructured Materials Division awarded Inspire Fellowship by Department of Science & Technology, Govt of India.

COLLOQUIUM

Internal

The Colloquium was continued during months of August- November in a twin lecture mode : One by a scientist at senior position and the other by a research entrant. The slew of lectures held is as follows:

Ms Somoshree Sengupta, CSIR-SRF, Bioceramics and Coating Division, "Influence of External Physical Stimuli on Efficacy of Anti-Cancer Drug"

Dr Kaushik Dana, Scientist, Refractory & Traditional Ceramics Division, "Amazing World of Clays"

Dr Smita Mukherjee, Guest Researcher, Advanced Mechanical and Materials Characterization Division, "Towards Fabrication of Functional Organo- Ceramics"

Dr Samar Medda, Scientist, Nanostructured Materials Division, "Functional Nanocomposite Coatings for Different Optical Applications"

Ms Ankita Bose, SRF, Ceramic Membrane Division, "All Silica DDR Zeolite Membrane – A Method for Production of Clean Fuel"

NEW INITIATIVE

SRUTI – Science-Research-Understanding-Technology-Innovation

A new forum to discuss, debate, analyze and frame various aspects related to Science-Research-Understanding-Technology-Innovation (SRUTI) was initiated. This forum is a platform that is designed to facilitate not only vibrant discussion in the frontier science being pursued currently at CSIR-CGCRI but also help deliberate upon the science that would enhance current knowledge and the process and power of innovation. This forum would also encourage discussion on new scientific discoveries and how such novel discoveries can prove to be the real game changer. So far four lectures have been delivered by scientists. These are as follows:

Dr K Muraleedharan, Director, CSIR-CGCRI, "Advanced Structural Characterization of Materials"

Dr Sandip Bysakh, Principal Scientist, Advanced Materials Characterization Unit under Nanostructured Materials Division, "Analytical TEM Characterization of Nanostructures in Advanced Ceramics, Composites and Thin films"

Dr Jui Chakraborty, Senior Scientist, Bio Ceramic & Coating Division, "The High-end yet Simple Defence Mechanisms in Nature: A Lesson for Us"

Dr Swapan Kumar Ghosh, Senior Principal. Scientist, Technical Co-ordination Cell. "Photon Correlation Spectroscopy for Size Measurement of Nanoparticles in Aqueous Suspensions"

LECTURES

August 7, 2015: Prof Pradeep Haldar, College of Nanoscale Science and Engineering, Department of Nanoengineering, Head, Nanoengineering Constellation, University at Albany, State University of New York, Albany, New York delivered a lecture on "Advances in Nanotechnology at SUNY Poly's CNSE".

August 14, 2015: Dr G K Dey, Associate Director, Materials Group, BARC, Mumbai delivered a lecture on "Structure of Metallic Glasses: Some New Perspectives".

September 24, 2015: Dr Ian Kasik, Senior Research Scientist and Dr Jan Mrazek, Post Doctoral Fellow, Institute of Photonics and Electronics, ASCR, Czech Republic delivered lectures on "Development of Tm-doped fiber for 2 Micron Application" and "Sol-gel Processing of Nanocrystalline Phosphor for Optical Amplifier" respectively.

October 6, 2015: Dr Manas K Bhunia, Post Doctoral Research Associate at KAUST Catalysis Center, KAUST, Kingdom of South Arabia delivered a lecture on "Harvesting Solar Light with Crystalline Carbon Nitrides for Efficient Photocatalytic Hydrogen Evolution".

October 29, 2015: Prof S P Mukherjee, Mentor, Indian Association for Productivity, Quality and Reliability, Kolkata delivered a talk on "Research Methodologies and Design of Experiments".

November 5, 2015: Prof Vikram Jayaram, Department of Materials Engineering & Chair, Division of Mechanical Sciences, Indian Institute of Science, Bangalore delivered a lecture on "Small Scale Testing of Mechanical Integrity of Coatings".

November 26, 2015: Mr Sabyasachi Saha, Electron Microscopy Group, Defence Materials Research Laboratory, Hyderabad delivered a lecture entitled "Material Characterization using Dual Beam SEM".

FACILITY



New Passenger Lift

A new passenger lift has been installed in the main building of CSIR-CGCRI. The lift can carry 6 passengers and has a net area of about 1 square meter. Dr K Muraleedharan inaugurated the facility on August 5, 2015 soon after he took over as Director.

OBITUARY



Mr B P Singh, Sr Technician (1) at CSIR-CGCRI Outreach at Khurja died after prolonged illness on November 23, 2015. The Publication Committee deeply mourns in his sad demise.

Forthcoming Events

- **November 30 – December 4, 2015:** T&D Programme on Physico-Chemical Analysis of Ceramic Raw Materials at Naroda Outreach of CSIR-CGCRI
- **December 7 – 12, 2015:** International Workshop on Emerging Areas in Photonics and Future Applications (IWPFA-2015) at CSIR-CGCRI, Kolkata
- **December 26, 2015:** 51st Research Council Meeting of CSIR-CGCRI