

CECRI NEWS

(A monthly newsletter of CSIR-CECRI)

September 2024

Vol. 5 Iss. 9

83rd Foundation Day of the Council of Scientific and Industrial Research

The 83rd Foundation Day of the Council of Scientific and Industrial Research (CSIR) was celebrated on September 30, 2024 at the CSIR-Central Electrochemical Research Institute (CSIR-CECRI), Karaikudi in a jubilant manner. Dr. Anupam Agnihotri, Director, Jawaharlal Nehru Aluminium Research Development and Design Centre (JNARDDC), Nagpur and Dr. Manish Jaiswal, Director, National Automotive Test Track (NATRAX), Pithampur graced the occasion as the Chief Guest and the Guest of Honour, respectively. As in previous years, in commemoration of the Foundation Day of CSIR, OPEN DAY was observed on September 26, 2024 and CSIR-CECRI was thrown open for all to visit and witness the legacy and ongoing R&D activities. As this opportunity comes only once in a year, visitors comprising of students, research scholars & general public thronged in large numbers (~15000) and got a glimpse of the historical and current technological achievements of CSIR-CECRI.



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CSIR-CECRI

CSIR-CENTRAL ELECTROCHEMICAL RESEARCH INSTITUTE

Your Destination for Innovative Research

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On the Foundation Day Celebration Event on September 30, 2024, **Dr. S. Vasudevan**, Chief Scientist, CSIR-CECRI welcomed the gathering and gave a brief overview on the genesis of CSIR and the events marking CSIR Foundation Day at CSIR-CECRI. **Dr. K. Ramesha**, Director, CSIR-CECRI, began his Presidential Address by congratulating Team CSIR-CECRI for **a)** successful organization of the OPEN DAY in which more than 15000 people including students from various academic institutions got enlightened on the technological achievements of CSIR-CECRI especially since last Foundation Day; and **b)** securing the **Second Prize by CSIR (Rs. 3 Crore + Citation)** in recognition of its outstanding innovation, dedication and contribution towards energy conservation and promoting energy efficiency amongst all CSIR Labs.

In his speech, Dr. Ramesha recalled with reverence the foresight and visionary thoughts of our leaders for establishing an exclusive body, CSIR, with a specialized mandate to do scientific and industrial research in our country that too in the year 1942, when our struggle for Independence was at its peak. He also put forth the impactful contribution of CSIR to science and society starting from the Indelible Ink used in the Elections, Amulspray - India's first Infant

Food to the recent achievements in the strategic sectors – HANSA, India's first indigenous Flying Trainer, the successful Chandrayaan-2 Mission etc. and CSIR's crucial role in fighting COVID Pandemic.

Dr. Anupam Agnihotri delivered the 83rd CSIR Foundation Day Lecture and he began his speech with a congratulatory poem hailing CSIR and CECRI for its achievements which are few of the many more to come. We all should consider ourselves to be fortunate to be living in this **Amrit Kaal of Bharat** which is brimming with opportunities particularly for innovators, MSMEs and start-ups, he opined.

He further said that the **Viksit Bharat 2047** Vision of our Hon'ble Prime Minister has created a level-playing field for all the budding entrepreneurs. Recently, India has leapfrogged to the 39th Position in the Global Innovation Index (GII) from its 81st Position in 2015 and success stories of Vande Bharat Trains, Tejas LCA – the most fuel efficient aircraft, landing on moon at the lowest cost, carbon-neutral India, etc. have contributed toward this, he remarked. CSIR and CSIR-CECRI is having an indispensable role to play towards Viksit Bharat and Aatmanirbhar Bharat, he further added.



Dr. Agnihotri also presented a glimpse of the ongoing R&D activities at JNARDDC and the areas of potential collaboration with CSIR. He provided an example of an innovative indigenous technology in sand filtration during oil extraction from oil wells by a startup which resulted in huge savings and import reduction.

Dr. Manish Jaiswal, in his address, delineated the mission and vision of NATRAX and their ongoing activities. NATRAX is Asia's longest and one of the high-speed state-of-the-art tracks in India for automotive testing and certification, he added. He also projected the potential areas of collaboration with CSIR-CECRI specially in the area of emobility and battery testing. A **Memorandum of Understanding** on battery testing between NATRAX and CSIR-CECRI

was inked and exchanged during the occasion.

During the event, the Chief Guest released the **Annual Report** of CSIR-CECRI for the year 2023-24. [e-version (flipbook) of the Annual Report is available in this [LINK](#)]. The Guests also distributed cash awards, prizes and certificates to the winners of various competitions conducted by CECRI Club for students and wards of CECRI in connection with the 83rd CSIR Foundation Day celebrations.

As a part of the event, staff members of CSIR-CECRI who superannuated during 2023-2024 and staff members of CSIR-CECRI who have completed 25 years of service were also honoured. The event concluded with a Vote of Thanks by **Shri. P. Shyam Sundar**, Administrative Officer, CSIR-CECRI.



Business Development and CSIR Theme Leads

Filing of Patent (Indian)

- ❖ A highly conductive carbon-based ink as a counter electrode for perovskite solar cells

Signing of NDA

- ❖ *Consultation for optimization of fluid dynamics and other physical parameters in the self-lifting cells* with Vaighai Chemical Industries Ltd., Karaikal

Signing of MoU

- ❖ *Research Collaboration in Battery Testing, Battery Chemistry* with National Automotive Test Tracks, Madhya Pradesh

- ❖ Online Meeting with DFCCIL, Mumbai [Sep 3, 4]
- ❖ Review Meeting with Industry partner (SSP 11/2024) [Sep 4]
- ❖ H2T Mission Mode Project Review Meeting [Sep 9]
- ❖ NTTM-Project Monthly Review Meeting [Sep 13]

- ❖ CLAIM Proposal Discussion [Sep 13]
- ❖ Discussion with M/s. Larsen & Toubro Ltd. [Sep 16]
- ❖ Meeting with L&T Energy Green-Tech Ltd. [Sep 18]
- ❖ Meeting with The Metal Powder Co. Ltd. [Sep 24]

Recent Research Projects Sanctioned

Industry Funded:

- ❖ Consultancy for the Process of Electroplating Grade Chromium Trioxide Storage, M/s. Vishnu Chemicals Limited, Chhattisgarh, Rs. 5.09 Lakhs, 6 months w.e.f. 11-09-2024 [CNP 03/2024]

Government Funded:

- ❖ Development of Non-cyanide Autocatalytic Silver Plating Chemistry, Rs. 19.88 Lakhs, 24 months w.e.f. 23-08-2024 [GAP 14/2024]




CSIR Funded:

- ❖ CSIR-Innovation Centre for Next Generation Energy Storage Solutions - Ver-2.0 (ICeNGESS Ver-2.0), Rs. 8998.82 Lakhs, 3 years w.e.f. 18-09-2024 [MMP065201]

Swachhata Hi Seva Campaign

Dr. K. Ramesha, Director, CSIR-CECRI inaugurated the **Swachhata Hi Seva** Campaign on September 23, 2024 at CSIR-CECRI, Karaikudi and led the **Swachhata Oath** taking event by CSIR-CECRI fraternity. As a part of the Campaign, a special plantation drive, **Ek Ped Maa ke Naam**, was carried out at CSIR-CECRI, Karaikudi with a mass participation of CSIR-CECRI Staff & Family Members and Scholars.

Honours and Awards

- ❖  **Dr. Rakesh Chandra Barik**, Principal Scientist and Head, Corrosion & Materials Protection Division, CSIR-CECRI has been awarded the **Shri. S.K. Seshadri Memorial Mascot National Award-2024** by the **Electrochemical Society of India (ECI)**, Bengaluru. The Award was presented to him during the **3rd International Conference on Electrochemical Science & Technology (ICONEST-2024)**, held at CSIR-National Physical Laboratory (CSIR-NPL), Dr. K.S. Krishnan Marg, New Delhi on September 8, 2024.
- ❖  **Dr. N. Rajasekaran**, Senior Scientist, Electroplating & Electrometallurgy Division, CSIR-CECRI has been awarded the **N.M. Sampat Award-2024** by the **Electrochemical Society of India (ECI)**, Bengaluru. The Award was presented to him during the **3rd International Conference on Electrochemical Science & Technology (ICONEST-2024)**, held at CSIR-National Physical Laboratory (CSIR-NPL), Dr. K.S. Krishnan Marg, New Delhi on September 8, 2024.
- ❖  **Ms. Ardra S Darsan**, DST-INSPIRE-JRF & AcSIR Scholar (Guide: Dr. P. Murugan) has bagged the **Third Prize** (Cash Award of Rs. 20,000/- + Certificate) for *From One-Pot to Powerhouse: Aluminium Doped Hematite Thin Films Heterostructured with Hexagonal ZnFe LDH for Electrocatalytic Water Oxidation in Alkaline Environment* in the Poster Competition during the **2nd Edition of International Conference on Green Hydrogen-2024** at Bharat Mandapam, New Delhi during September 11-13, 2024 jointly organized by MNRE, MOPNG, DSIR, DST, PSA, Govt. of India.

Featured Article

A Popular Science Story on the Lithium-Ion Battery Technology of CSIR-CECRI has been featured in an exclusive column of the Employment News focusing on R&D Breakthroughs of Indian Labs. [Employment News, Issue no 22, 31 August - 06 September 2024]. https://x.com/Employ_News/status/1829585631649100075

An exclusive interview by Dr. K. Ramesha, Director, CSIR-CECRI shed light on the solutions to various FAQs covering all the common doubts and queries in this critical area of sustainable energy sector which is poised for a boom in the near future.



The image shows the cover of the Employment News magazine, dated 31 August - 6 September 2024. The main headline is "Battery Breakthroughs: India's Advancements in Lithium-ion Battery Technology". Below the headline, there is an interview section with Dr. K. Ramesha, Director, CSIR-CECRI, Karaikudi, Tamil Nadu. The cover also features a small photo of Dr. Ramesha and some technical diagrams related to battery technology.

Skill Development Activities

Skill Development Training Programmes:

- ❖ A Skill Development Training Programme on **Operation and Maintenance of Analytical Instruments** was organized by CSIR-CECRI during September 2-6, 2024. 40 participants underwent this training programme.
- ❖ A Skill Development Training Programme on **Electroplating and Metal Finishing** was organized by CSIR-CECRI during September 9-13, 2024. A total of 34 participants got trained.

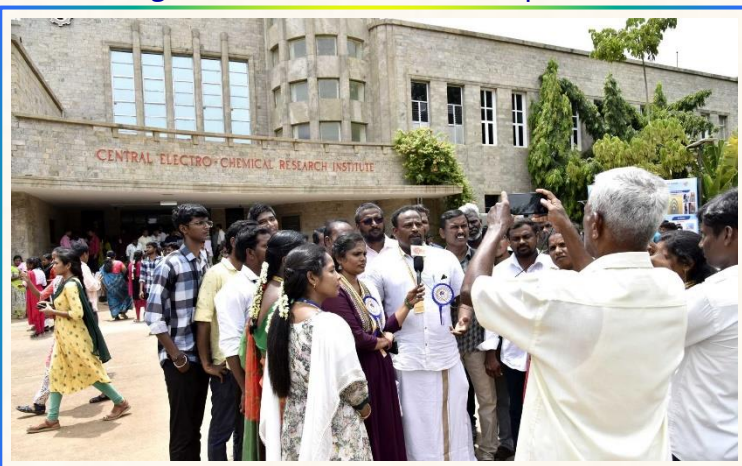
JIGYASA:

Under CSIR-JIGYASA Programme, the following events took place during August 2024:

- ❖ Visit of Students: On the occasion of Open Day, students were exclusively given awareness lectures on the **CSIR-Jigyasa - Student-Scientist Connect Programme** of CSIR. More than 1000 school students from around 13 schools along with 77 school teachers and 4000 college students visited

from 71 colleges along with 306 faculties attended this event and gained valuable insights on the various outreach activities conducted by CSIR-CECRI under the Banner of CSIR-Jigyasa.

- ❖ Pudhugai FM Radio Officials visited CSIR-CECRI, Karaikudi on the occasion of Open Day on September 26, 2024 and gave an extensive coverage of the activities that took place.



Industry-Student Connect Lecture



Under a new initiative of Industry-Student Connect Lecture mooted for the benefit of the B.Tech. Students and AcSIR Research Scholars of CSIR-CECRI, Dr. Gavin Towler, Honeywell International, USA delivered a special lecture on *Sustainability Engineering* at CSIR-CECRI, Karaikudi [Sep 3]. Dr. Gavin Towler is leading R&D activities for Honeywell's Advanced Materials, UOP and Process Automation businesses. He is the co-author of *Chemical Engineering Design*, a textbook on process design, and is an Adjunct Professor at Northwestern University and National University of Singapore. He also had an engaging interaction with the Scientists.

Deputation Abroad

Dr. K. Ramesha, Director, CSIR-CECRI visited Siberia and Russia [Sep 10-19] and represented CSIR in the 12th International Congress & Exhibition on Non-Ferrous Metals and Minerals at Krasnoyarsk, delivered Lectures and participated in the Round Table Discussions. He also visited the Non-Ferrous Metals Plant at Siberian Federal University, Krasnoyarsk, Siberia and the R&D Facilities of In-Energy (MIPT), The National University of Science and Technology MISIS, Baikov Institute of Metallurgy and Materials Science (IMET) and Giredmet JSC in Moscow, Russia. Many collaborative proposals were discussed in detail and are conceptualized for further directions.



Official Events

- ❖ H2T Mission Mode Project - Internal Review Meeting [Sep 2]
- ❖ Annual General Body Meeting of SAEST [Sep 2]
- ❖ iSAEST Technical Committee Meeting [Sep 2, 11]
- ❖ Review Meeting for 83rd CSIR Foundation Day Celebrations [Sep 3,10, 19]
- ❖ Hindi Song Competition [Sep 4]
- ❖ Hindi Quiz Competition [Sep 5]
- ❖ RC Sub-Committee Review Meeting [Sep 5]
- ❖ Laboratory Strategic Group Meeting [Sep 6, 12]
- ❖ Patent Committee Meeting [Sep 13]
- ❖ Official Language Implementation Committee (OLIC) Meeting [Sep 23]
- ❖ General Quiz Competition - 83rd CSIR Foundation Day Celebrations [Sep 24]
- ❖ CECRI Ladies Forum Meeting [Sep 27]

CFE and AcSIR Highlights

- ❖ B. Tech. Orientation Programme 2024-25 [Sep 9]
- ❖ B.Tech. Placement Meeting [Sep 12]
- ❖ Campus Interview for B.Tech. Students [Sep 20]
- ❖ DAC-I for Mr. V. Ananth, AcSIR Scholar, (Guide: Dr. N. Rajasekaran) [Sep 4]
- ❖ Synopsis Submission of Mr. Amuthan Dekshinamoorthy, AcSIR Scholar – Thesis Title: *Surface Confined Molecular Architectures for Electrochemical Applications* (Guide: Dr. V. Saranyan) [Sep 5]
- ❖ DAC-III for Mr. Murugasenapathi (Guide: Dr. P. Tamilarasan) [Sep 6]
- ❖ AcSIR PhD & IDDP Scholars Meet [Sep 9]
- ❖ Synopsis Submission of Mr. Anadebe Chikaodili Valentine, AcSIR Scholar – Thesis Title: *Study of CO₂ Corrosion Inhibition in Oil and Gas Environments* (Guide: Dr. Rakesh Barik) [Sep 11]
- ❖ PhD Viva Voce Examination for Mrs. S. Hemavathi, AcSIR Scholar – Thesis Title: *Design Approaches to Improve the Electrical and Thermal Characteristics of Battery Packs for Electric Vehicle Applications* (Guide: Dr. A.S. Prakash) [Sep 18]
- ❖ DAC-II Meeting of S. Singha Roy, AcSIR Scholar, (Guide: Dr. Subrata Kundu) [Sep 18]
- ❖ PhD Viva Voce Examination for Mr. V. Prabakaran, AcSIR Scholar – Thesis Title: *Design and Evaluation of Bifunctional Electrocatalyst for Zinc-Air Battery Application* (Guide: Dr. A.K. Sahu) [Sep 20]
- ❖ PhD Viva Voce Examination for Mr. Arun Karmakar, AcSIR Scholar – Thesis Title: *Surface Engineering of Transition Metal Based Nano-structures for Water Splitting Application* (Guide: Dr. Subrata Kundu) [Sep 24]
- ❖ DAC-III for Mr. P. Sampathkumar, AcSIR Scholar (Guide: Dr. C. Suresh) [Sep 27]

Orientation for Freshers of CFE

Orientation for Freshers of B.Tech. (Chemical & Electrochemical Engineering) [2024-'28], Centre for Education (CFE), CSIR-CECRI was organized on September 9, 2024. Since its inception in 1988, this unique course has been producing torchbearers in Electrochemical Science & Technology. An elaborate briefing on the Course and its features along with relevant details regarding the academic life, campus life, alumni association, placement opportunities, higher studies – national and abroad, etc. was made to the freshers and their parents.

New Members in CSIR-CECRI Family



Mrs. S. Jothilakshmi
Assistant Section Officer (F&A)

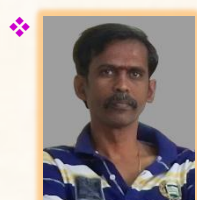
Finance & Accounts Section
Date of Joining: 25/07/2024



Mr. R. Baratharaja
Section Officer (F&A)

Finance & Accounts Section
Date of Joining: 13/09/2024

Transfer to Other CSIR Labs



Mr. N. Kalidhas
Principal Technical Officer

CSIR-4Pi, Bengaluru
Date of Relief: 30/09/2024



Mr. K. Sureshkannan
Senior Technician (1)

CSIR-NIIST, Thiruvananthapuram
Date of Joining: 30/09/2024

Snapshots



A Section of Visitors During Open Day 2024



Swachhata Hi Seva Campaign – Oath Taking and Plantation Drive



Placement Interview for B.Tech. Students



Orientation Programme for B.Tech. Freshers



Competitions for Wards in Commemoration of 83rd Foundation Day of CSIR



TECHNOLOGY COMPENDIUM OF CSIR-CECRI

- ❖ Indigenous Li-ion battery
- ❖ Indigenous Sodium Ion Battery
- ❖ Performance Improved Lead Acid Battery
- ❖ CO₂ capture under flue gas conditions
- ❖ Integrated Corrosion Monitoring Sensor Gadget accessible through a Mobile App
- ❖ Thermal Barrier Coatings for Strategic Applications
- ❖ Electrochemical Production of Sodium Hypochlorite as a Disinfectant (against COVID-19)
- ❖ Tri-layered reusable face mask with antibacterial coating
- ❖ Polymer Electrolyte Membrane (PEM) fuel cell
- ❖ Triboluminescent Coating and Smart Camera for Crack Detection in Structural Components
- ❖ Electrochemical Defluoridation of Drinking Water
- ❖ Solar Powered Proton Exchange Membrane (PEM) Based Water Electrolyser for Hydrogen Generation
- ❖ Cement-Polymer Composite Coating System for Corrosion Protection of Reinforcing and Prestressing Steels
- ❖ Solid Lubricant Coatings for Brahmos Missile Application
- ❖ Li Spheres for Torpedo Applications
- ❖ Electrowinning and Recovery of Tin from Primary Ore and Secondary Sources
- ❖ Electroplating of Gold, Copper and Nickel, Chromium, Zinc-Nickel Alloy; Anodizing of Aluminium; Electropolishing of Stainless Steel
- ❖ Electro-catalytic Conversion of CO₂ and butadiene to Adipic Acid; CO₂ to Formic Acid; CO₂ to Oxalic Acid.
- ❖ Farmer Friendly Soil Health (predictive) Analyzer
- ❖ Three Coat System for Steel Structures
- ❖ Inhibitor Cement Slurry Coating for Rebars
- ❖ Electrochemical Preparation of DL-Homocysteine Thiolactone Hydrochloride from DL- Homocystine
- ❖ Electrochemical Perfluorination of Sulfolane to Perfluro Butane Sulfonyl Fluoride
- ❖ Electrochemical Preparation of Calcium Lactobionate and Calcium Gluconate
- ❖ Electrochemical Production of KIO₃
- ❖ Degradable Amorphous Alloy Coatings by Sputtering for Bioimplants
- ❖ Multicoat Protective Schemes for Concrete Structures and Bridges
- ❖ Moisture Compatible Coating for Cooling Towers
- ❖ Temporary Protective Coating for Maraging Steel & 15CDV6
- ❖ Corrosion Resistant Thermal Coating for Hydroclaves
- ❖ Al-Zn-In Galvanic Alloy Anode for Cathodic Protection
- ❖ Formulation of Neutral Paint Removing Jelly
- ❖ Corrosion Resistant Inhibitive Admixtures for Portland Pozzolana Cement
- ❖ Inhibitor Admixture for Concrete
- ❖ Cost Effective Metallic Coatings to Rebars Embedded in Concrete Structures
- ❖ Redox Active Polymer Encapsulated Lamellar (REL) Compound based Anticorrosive Coating for Reinforcement Bars
- ❖ Extraction of Calcium, Magnesium by Molten Salt Electrolysis
- ❖ Extraction of Zinc oxide and Metallic Zinc from Galvanizer Ash
- ❖ Extraction of Rare Earths and Alloys by Molten Salt Electrolysis

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