



CECRI NEWS

(A monthly newsletter of CSIR-CECRI)
compilation of significant happenings

82nd Foundation Day of CSIR

The 82nd Foundation Day of the Council of Scientific and Industrial Research (CSIR) was celebrated at CSIR-Central Electrochemical Research Institute (CSIR-CECRI), Karaikudi on September 27, 2023. A bouquet of events was organized during September 2023 in commemoration of the Foundation Day and the prize winners were felicitated on September 27, 2023. **Prof. V. Palanimuthu**, Director, National Institute of Food Technology, Entrepreneurship & Management, Thanjavur graced the occasion as the Chief Guest. **Dr. K. Ramesha**, Director, CSIR-CECRI, Karaikudi presided over the function. In the Celebration Event organized by CSIR HQ on this occasion at Bharat Mandapam, New Delhi, Union Minister of Science and Technology **Dr. Jitendra Singh** graced the Event as the Chief Guest. In his address he also read out our **Hon'ble Prime Minister's** message on CSIR's 82nd Foundation Day.



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*Even sky is not the limit for the
Indian scientific community*

- Shri. Narendra Modi
Hon'ble Prime Minister and
President, CSIR
on the occasion of
82nd Foundation Day of CSIR



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Hon'ble Prime Minister Shri. Narendra Modi, President of CSIR, hailed the Council's 81-year-old journey and its prominent role in serving society, industry and the nation. Remarking on CSIR's recent contributions to Chandrayaan 3 he said: "Even sky is not the limit for the Indian scientific community." He also mentioned the Aroma Mission involving India's export of lemongrass oil, strides in floriculture, the Purple Revolution ushered in through lavender cultivation in Jammu & Kashmir and laying of Steel Slag roads. **Dr. Jitendra Singh**, Union Minister of S&T, GOI and Vice-President, CSIR spoke of the government's policy of unlocking scientific GOI institutions and lifting the veil of secrecy shrouding them. Earlier, **Dr. N. Kalaiselvi**, the first woman DG of CSIR in 81 years, recounted milestones in the CSIR journey and said CSIR is preparing a vision document – **CSIR at 2042** – to mark the Centenary of the Council which would blend perfectly with India@2047 Goals.

The **82nd CSIR Foundation Day Event at CSIR-CECRI, Karaikudi** on September 27, 2023 commenced with a Welcome Address by **Dr. V. Saraswathy**, Chief Scientist, CSIR-CECRI in which she highlighted the seminal contribution of CSIR to the society and the crucial role played by CSIR-CECRI in the R&D interventions. In his Presidential Address, **Dr. K. Ramesha**, Director, CSIR-CECRI described the indispensable part of CSIR-CECRI towards the growth of CSIR leading to the growth of our Nation. *We are the torch-bearers in this specialized area of Electrochemical Science and Technology in the Global Arena and we should stride forward with immense pride and prove to be the trendsetters for ever*, he opined.



Prof. V. Palanimuthu, Chief Guest, in his **Foundation Day Lecture on Food Processing and Recent Advances** defined in detail all the terms associated with food processing, the need for food processing, the key market drivers and indicators and the emerging trends in this area worldwide. He also indicated where the food industry is heading to and the upcoming opportunities for R&D labs. He further shed light on R&D areas where CSIR labs can collaborate especially on the R&D avenues available for CSIR-CECRI in this field. The Chief Guest released the 2022-2023 Annual Report of CSIR-CECRI. He also presented Awards to the wards of CSIR-CECRI Employees for excelling in the +2 Board Examinations & securing admissions in prestigious Institutions for higher studies and Prizes to the winners of various competitions organized by CSIR-CECRI Club in commemoration of the 82nd Foundation Day of CSIR.

On this occasion, staff members retired from service since last foundation day and staff members who have completed 25 years of service in CSIR were suitably honoured. Staff Members who excelled in the preceding year were also felicitated with Mementos & Citations. The Event ended with a Vote of Thanks by **Mr. P. Shyam Sundar**, Administrative Officer, CSIR-CECRI.

In commemoration of the 82nd Foundation Day of CSIR, CSIR-CECRI, Karaikudi observed "**OPEN DAY**" on 26.09.2023. More than **15000** visitors including school & college students, and general public from Karaikudi and neighbouring districts witnessed the ongoing R&D activities & technologies of CSIR-CECRI.



Honours and Awards

As in the previous year, achievements of Division / Scientists of CSIR-CECRI were honoured during the 82nd CSIR Foundation Day Celebrations at CSIR-CECRI, Karaikudi under the following categories:

- ❖ **Highest ECF Earning Division:**
Chennai Unit, CSIR-CECRI
- ❖ **Highest ECF Earning Scientist (Grant-in-Aid):**
Dr. Vishal M Dhavale, Chennai Unit, CSIR-CECRI
- ❖ **Highest ECF Earning Scientist (Non Grant-in-Aid):**
Dr. G. Sreedhar, Electroplating & Metal Finishing Division, CSIR-CECRI, Karaikudi
- ❖ **Scientist whose publication received highest citation**
Dr. Subrata Kundu, Electrochemical Process Engineering Division, CSIR-CECRI, Karaikudi
- ❖ **Successful technology transferred**
 - 1) Process for CO₂ capture under flue gas conditions
 - 2) Operations know-how for Lithium-ion battery cell making
 - 3) Manufacture of four coat paint schemes consisting of epoxy & polyurethane paint systems for concrete structures
 - 4) Process for fabrication of 2.7 V, 100 F cylindrical supercapacitor and value-added high surface area carbon for the fabrication of supercapacitors.
 - 5) Demonstration and validation of a low-temperature polymer electrolyte membrane fuel cell (LT-PEMFC) system for automotive application
 - 6) High performance moisture compatible corrosion resistant protective coating system
- ❖ **Scientist who has received well recognised award**
 - 1) Dr. Subrata Kundu - Fellow of Royal Society of Chemistry (FRSC) & Associate Editor for Journal of Materials Chemistry A and Materials Advances
 - 2) Dr. Subbiah Alwarappan - Japan Society for the Promotion of Science (JSPS) Fellowship
- ❖ **Best Exhibited Model during Open Day 2023:**
PEM Water Electrolyser

Recent Research Publications

- ❖ Thermal resistance behaviour of concrete with recycled plastic waste fine aggregates
M. Ashok, P. Jayabalan and J. Daniel Ronald Joseph
Innovative Infrastructure Solutions, 8 (2023) 257; <https://doi.org/10.1007/s41062-023-01226-2>
- ❖ Label-free genosensing of dengue serotypes with an electrodeposited reduced graphene oxide-tris (bipyridine) ruthenium (II)
P. Kanagavalli, C. Andrew, K.A. Babu, M. Jayakumar and V. Murugan
International Journal of Biological Macromolecules, 253[2] (2023) 126746;
<https://10.1016/j.ijbiomac.2023.126746>
- ❖ Regulating the selective adsorption of OH* over the equatorial position of Co₃O₄ via doping of Ru ions for efficient water oxidation reaction
M. Ragunath, Arun Karmakar, A. Preethi, M. Jaisakthi, Pradeep Gudlur and Subrata Kundu
Journal of Materials Chemistry A, 11 (2023) 21767; <https://doi.org/10.1039/D3TA03822J>
- ❖ Tuning the active sites and optimizing the d-spacing value in CoFe-LDH by ex-situ intercalation of guest anions: an innovative electrocatalyst for overall water splitting reaction
N. Sreenivasan, Arun Karmakar, M. Ragunath, H.N. Dhandapani, Suprobhat Singha Roy and Subrata Kundu
Catalysis Science & Technology, 13 (2023) 6377; <https://doi.org/10.1039/D3CY00859B>
- ❖ Label-free electrochemical immunoprobe for dengue infection marker detection
P. Kanagavalli and V. Murugan
Current Science, 125 (2023) 602

Business Development Leads

- ❖ Meeting with Bharat Petroleum Corporation Ltd., CCKPL, Kochi [Sep 1]
- ❖ Meeting with M/s. Aurobindo Pharma and M/s. BGR Tech on R&D collaboration [Sep 5-6]
- ❖ Meeting of NCCI and GAIL (India) Ltd. [Sep 6]
- ❖ Meeting with Azure Power India Pvt. Ltd. on collaborative projects [Sep 11]
- ❖ Review Meeting on *Preparation of hexagonal Boron Nitride through molten salt technique* [Sep 12].
- ❖ Meeting on Green Hydrogen with Secretary, Heavy Industries, GOI and BHEL Team [Sep 16]
- ❖ Review Meeting on *Process for production of green propylene carbonate and subsequent conversion to polyurethane from CO₂* [Sep 22]
- ❖ Meeting on Green Hydrogen with Novel Energy Research & Technology Co. Pvt. Ltd., Pune [Sep 22]
- ❖ Meeting with M/s. Excel Industries Ltd. on R&D collaboration [Sep 29]

Knowhow Transferred

- ❖ **High performance moisture compatible resistant protective coating system** to M/s. Berger Paints Ltd., Kolkata for Rs. 15 lakhs for 5 years wef 25/08/2023.
- ❖ **High performance moisture compatible resistant protective coating system** to M/s. Krishna Conchem Products Pvt Ltd., Maharashtra for Rs. 12 lakhs for 5 years wef 13/09/2023.

Official Events

- ❖ Engagement of Project Personnel [Sep 5-6]
- ❖ Meeting of the Laboratory Strategic Group [Sep 8]
- ❖ Online Training Programme on CCS (Conduct) Rules by CSIR-HRDC, Ghaziabad [Sep 8]
- ❖ Online Programme on RTI, Transparency and Mandatory Disclosures by CSIR-HRDC [Sep 11]
- ❖ Meeting of the Student Academic Committee [Sep 12]
- ❖ Meeting on CSIR Foundation Day 2023 Celebrations [Sep 12, 20]
- ❖ Meeting of Subcommittee for CSIR Foundation Day 2023 Celebrations [Sep 12, 21]
- ❖ Lecture on *X-Ray Techniques* by Dr. N. Lakshminarasimhan to the Research Scholar Forum, CSIR-CECRI [Sep 14]
- ❖ CSIR Foundation Day 2023: Competitions for Staff Wards, B. Tech. Students and Research Scholars [Sep 17]
- ❖ Quiz Competition in connection with CSIR Foundation Day 2023 [Sep 21]

Skill Development Activities

Skill Development Training Programmes:

- ❖ A Skill Development Training Programme on **Chromatography and Spectroscopy** was organized by CSIR-CECRI during Sep 11-15, 2023. A total of 55 participants took part in this event.
- ❖ A Two-day Online Industry Oriented Refresher Course was conducted by CSIR-CECRI for M/s. ITC Ltd., Bangalore on **Lithium-ion Battery: Materials to Manufacturing** [Sep 21-22].

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- ❖ An Animated Video on **Working principle of Electromotive force (EMF)** (as per TFC recommendations on +2 NCERT Syllabus) and
- ❖ A Demo Video content on **To understand the conversion of IC engine to e-Vehicle** were submitted to Gitlab managed by IIT-Bombay.

CFE and AcSIR Highlights

- ❖ JRF to SRF Upgradation Meeting for Ms. V. Renuka, IDDP Student (Guide: Dr. V. Ravi Babu) [Sep 1]
- ❖ PhD Viva Voce Examination for Mr. Lawal Usman (10CC19A05002) (Guide: Dr. V. Ravibabu) [Sep 7]
- ❖ III DAC Meeting of Ms. K.M. Lakshmi, AcSIR Scholar (Guide: Dr. C. Jeyabharathi) [Sep 7]
- ❖ Webinar on *Role of Women in Leadership Roles* for B.Tech. Students [Sep 22]
- ❖ Scrutinizing Committee Meeting for PhD Admission - January 2024 Session [Sep 25]
- ❖ Meeting for Upgradation of JRF to SRF [Sep 25]

Invited Lecture

- ❖ **Dr. Walaa Ahmed Mohammed Hussein, CV Raman International Fellow from Al Azar University, Egypt** gave a talk on **MXene based materials for energy storage systems** [Sep 20]. She explained in detail about the origin of MXene materials and its synthesis process by using various techniques. Further, she pointed out the important characteristics of MXene and how the spectroscopic techniques help to characterize the MXene materials. She shed light on how to stabilize the MXene materials for a longer period to get enhanced performance in energy storage devices such as supercapacitors. She also highlighted the challenges associated with the synthesis of MXene materials.

Exhibition on CSIR Decadal Achievements

As part of the 82nd CSIR Foundation Day Celebrations, a **Mega CSIR Exhibition on CSIR Decadal Achievements (2014-2023)** was organized on 27th September 2023 at Hall No. 2, Bharat Mandapam (Pragati Maidan), New Delhi. Over 40 Pavilions were arranged to showcase the achievements of all CSIR Labs spread across the country. Exclusive Quiz Sessions, Technical Sessions/Debates, Interaction with CSIR Scientists, Interaction with Start-ups and Incubatees were also organized. The following technologies of CSIR-CECRI were showcased:

- ❖ Li-ion Battery Technology
- ❖ Trivalent hard Chromium Plating Process
- ❖ Point of Use Filter for Arsenic Remediation in Drinking Water
- ❖ Polymer Electrolyte Membrane Fuel Cell (PEMFC) Technology
- ❖ Four Coat System for Concrete Surfaces
- ❖ High Performance Moisture Compatible Corrosion Resistant Coating
- ❖ Portable Soil Testing Kit for Soil Health Analysis
- ❖ Electrochemical Synthesis of 4-Aminophenol
- ❖ Wearable Electrochemical Sensors for Healthcare Monitoring
- ❖ Process for Value-added High Surface Area Carbon & Fabrication of 2.7 V, 100 F Cylindrical Supercapacitor
- ❖ Rechargeable Aluminium-Air Battery for a Better Tomorrow
- ❖ Redox Flow Batteries for Large Scale Storage of Electricity
- ❖ CSIR-CECRI's Indigenous Benchmark Material for Carbon Capture
- ❖ Green Hydrogen: Proton Exchange Membrane (PEM) Electrolyser

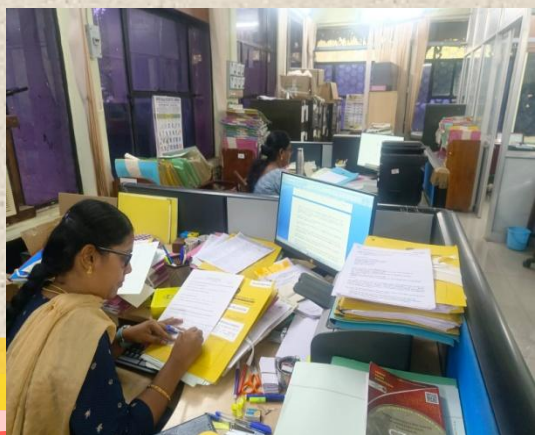


Hindi Month Celebrations

As in previous years, **Hindi Month** was observed in CSIR-CECRI from **September 01 to September 30, 2023**. Every year the month of September is dedicated to Hindi activities that creates an environment in the office to encourage the employees to work more in Hindi.

During **Hindi Month 2023 Celebrations**, the following competitions/programs were organized, in which scientists, technical staff, administrative staff, and the B.Tech. students and Research scholars also participated enthusiastically:

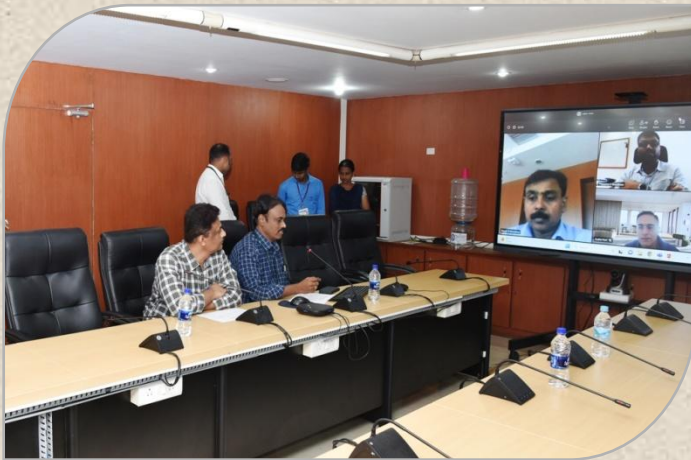
- ❖ Hindi Online Quiz Competition (Sep 1)
- ❖ Joint Hindi Sulekh for CECRI & TOLIC (Sep 4)
- ❖ Section wise Competition for Admin Staff (Sep 5)
- ❖ Competitions for Wards of CECRI Staff Members - 1. Poem Recitation and 2. Pick & Talk (Sep 9)
- ❖ Joint Hindi Word Building for CECRI & TOLIC (Sep 11)
- ❖ Hindi Elocution for Technical Staff (Sep 12)
- ❖ Joint Hindi Workshop for TOLIC & CECRI (SEP 13)
- ❖ Director's Appeal on Hindi Day (Sep 14)
- ❖ Poster Presentation Competition for Scientists & Research Scholars (Sep 14)
- ❖ Hindi Song Competition (Sep 15)
- ❖ Hindi Quiz Competition (Sep 20)
- ❖ Hindi OLIC Meeting [Sep 22]



Snapshots



Knowhow Transfer to M/s. Berger Paints Ltd., Kolkata and M/s. Krishna Conchem Products Pvt Ltd., Maharashtra



Online Industry Oriented Refresher Course and Skill Development Training Programme organized by CSIR-CECRI



B.Tech. First Year Orientation Programme



Invited Lecture by Dr. Walaa Ahmed Mohammed Hussein



Presentation of Award on 82nd CSIR Foundation Day

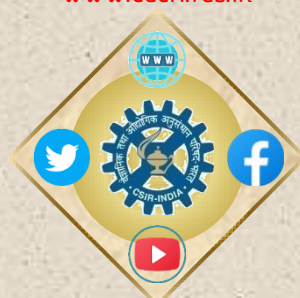


A section of Visitors on OPEN DAY at CSIR-CECRI

- ❖ 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 Perfluoro 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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