CECRI NEWS

(A monthly newsletter of CSIR-CECRI)

November 2024 Vol. 5 Iss. 11

Curtain Raiser Event of India International Science Festival 2024

The 10th edition of **India International Science Festival 2024 (IISF-2024)** is set to be hosted at Indian Institute of Technology-Guwahati (IIT-Guwahati) from 30th November to 3rd December, 2024. Its curtain raiser event was organised at **CSIR-Central Electrochemical Research Institute, Karaikudi** on 09th November 2024 with great enthusiasm. **Dr. (Mrs.) N. Kalaiselvi**, Secretary, Department of Scientific & Industrial Research and Director General, Council of Scientific & Industrial Research, New Delhi and Chairperson, Steering Committee, IISF-2024 graced the occasion as the Chief Guest, inaugurated the event and delivered an illuminating lecture highlighting recent contributions of CSIR to science and society. **Shri. S. Krishnan**, Secretary, MeitY, Govt. of India and Member Steering Committee, IISF-2024 graced the occasion as the Guest of Honour and delivered an inspirational lecture with possible collaboration avenues between MeitY and CSIR.

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CSIR-CECRI
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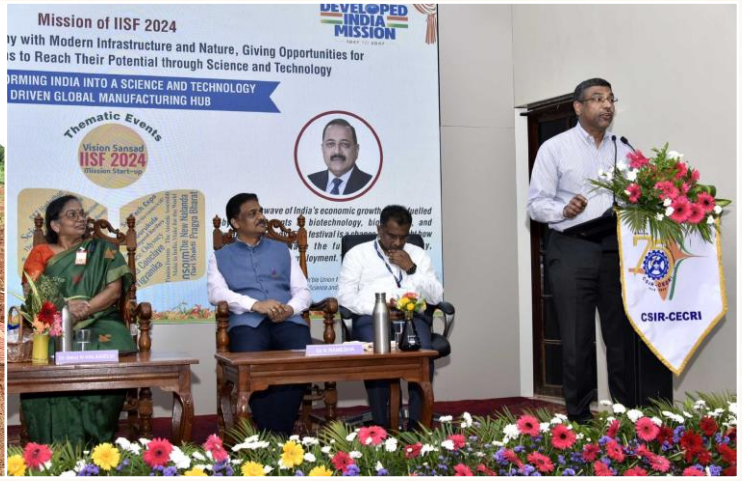
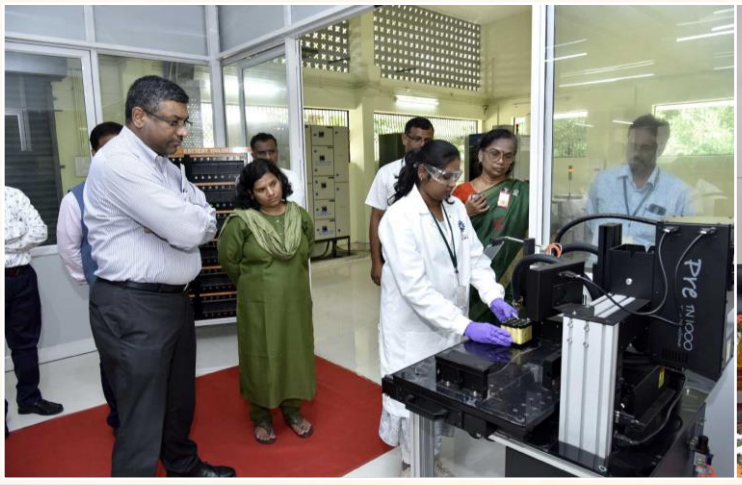


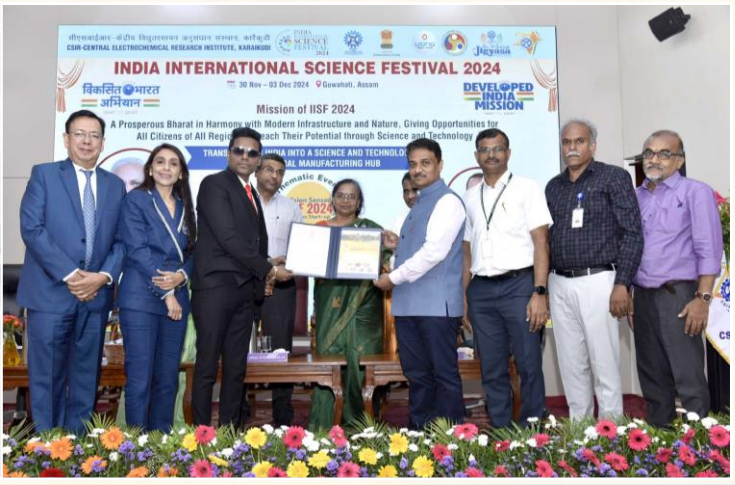
Welcoming the gathering, **Dr. K. Ramesha**, Director, CSIR-CECRI emphasized the importance of IISF and cited the statement of Hon'ble Minister for Science Technology, that the annual IISF celebration focusses not only on collaborating and showcasing science and technology to the people of India but also to the global community. He highlighted CSIR-CECRI's recent successful technologies transferred on batteries, hydrogen generation and fuel cells, etc., to various industries.

Dr. N. Lakshminarasimhan, Senior Principal Scientist, CSIR-CECRI, gave a briefing on the history of IISF which is organized since 2015 and its goal of popularizing science through organizing its 10th edition in 2024 by the CSIR involving several Ministries and Scientific Departments of the Government of India in collaboration with Vijnana Bharati. He added that the purpose of holding IISF-2024 at IIT Guwahati, Assam, is to promote inclusive development in the North-East region. He mentioned about the 25 thematic events of IISF 2024 and quoted that the Hon'ble Prime Minister's statement: "***Today the goal of the country is Viksit Bharat, Sashakt Bharat! We cannot stop until this dream of a developed India is fulfilled***" is comparable to the famous quote of Swami Vivekanda "***Arise, awake and stop not till the goal is reached***".

Dr. N. Kalaiselvi, the Chief Guest, addressed the gathering with her customary energy & dynamics and stressed the important role that science will play in transforming India into a developed country by 2047 (Viksit Bharat). She said, *science only helps to make life memorable and meaningful*. From being a participant, CSIR has grown leaps and bounds to be the Organizer of the 10th edition of IISF, thereby boosting our confidence and giving the right platform for showcasing our abilities, she added. In her inspiring and passionate speech which served as a great motivation for the student participants from nearby institutions and schools, she stressed that Science only can reform our Nation.

In his maiden visit to CSIR-CECRI, the Guest of Honour, Shri. S. Krishnan, acknowledged the endowment efforts of Dr. RM. Alagappa Chettiar towards the establishment of this premier research laboratory in the dry region of Tamil Nadu. Today, fortunately, India is in a position of a serious contender as a global power, as a country of importance, as a country of eminence, due to our tremendous growth with the shouldering support of giants of the past like Dr. Alagappa Chettiar.





He lauded the pioneering battery technologies of CSIR-CECRI and opined that MeitY and CSIR-CECRI should find a way to work together on e-vehicles and battery technologies. *We need to understand the role of science in society and role to play in human development*, he added. The spirit of IISF is to showcase our scientific achievements and to explain the ways in which we can move forward, he said. One of the prime areas of manufacturing in India is electronics as today the import of electronic goods holds same significance as import of oil in India, he said. We are importing electronics through cluster sources and adopting scientific methods will ensure and enhance our ability to manufacture in the country which will be more cost effective and generate more employment opportunities, he added. He further remarked that our objective should be towards increasing our global share in the manufacturing of electronics as India has less than 2% of the entire manufacturing of electronics which accounts for around US$160 billion whereas our Prime Minister has set a goal for us of reaching US$500 billion of electronics manufacturing by 2030.

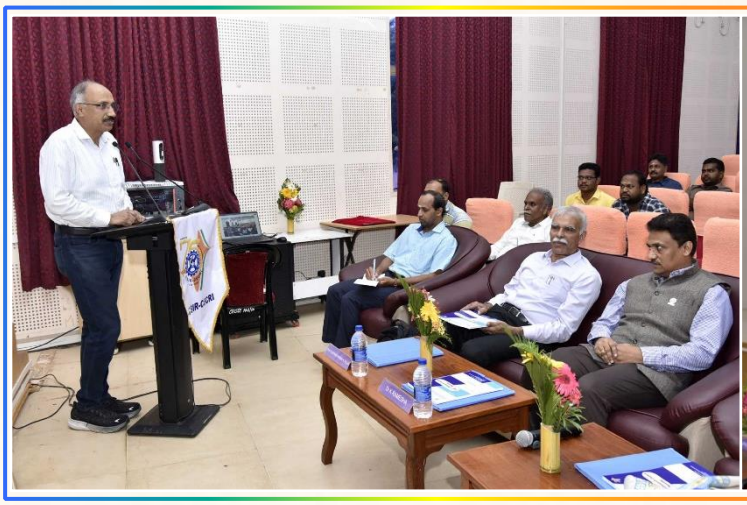
In 2014, we were importing 76% of the total mobile phones used by us whereas, today, 99.2% of mobile phones are made for export, with a major chunk of it from Tamil Nadu, he claimed. He also emphasized that the designing of products need more R&D and this is where the partnership between CSIR-CECRI and industry is so vital, he said. Dr. K.J. Sreeram, Director, CSIR-CLRI, Chennai and Dr. N. Anandavalli, Director, CSIR-SERC, Chennai offered felicitations. During this event, CSIR-CECRI's technology on Supercapacitors was transferred to Super Electro Green Technology Pvt. Ltd., Haryana. The event concluded with vote of thanks by Dr. Jonas Davidson, Chief Scientist, CSIR-CECRI.

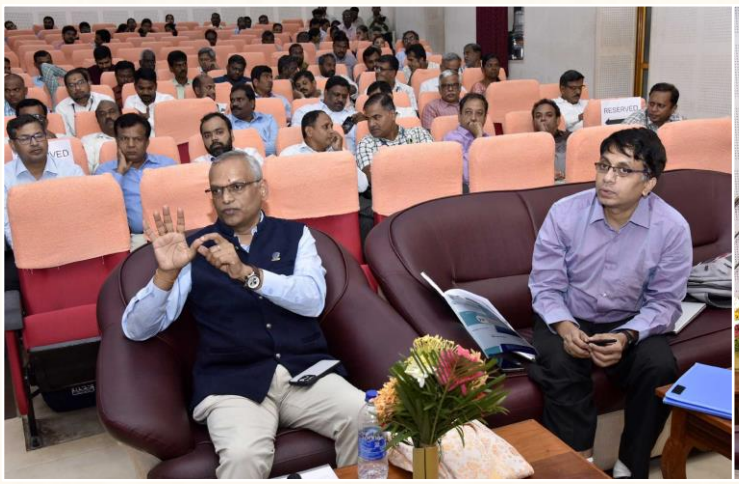
74th Meeting of the Research Council

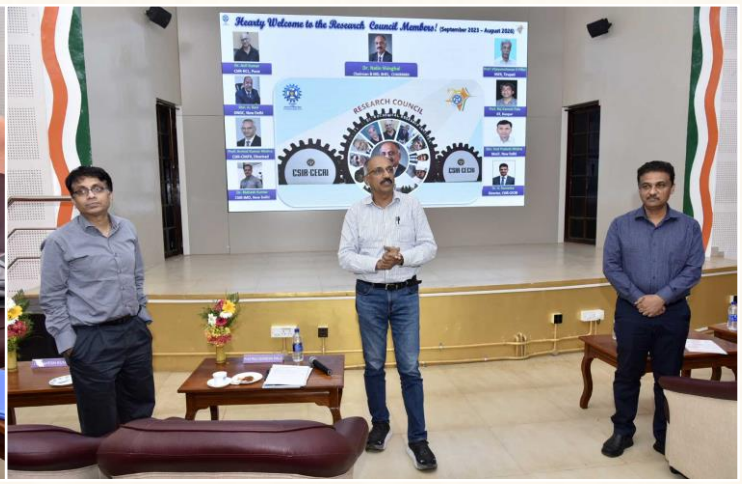
The 74th Meeting of the **Research Council of CSIR-CECRI** was convened during November 13 & 14, 2024 at CSIR-CECRI, Karaikudi. This Meeting was held in an Open mode in Dr. Abdul Kalam Auditorium, CSIR-CECRI. **Dr. K. Ramesha**, Director, CSIR-CECRI welcomed the RC Members and all the participants. The Chairman, **Dr. Nalin Shinghal**, former Chairman & Managing Director, Bharat Heavy Electricals Ltd., New Delhi, conducted the proceedings. As always, he appealed for an active and interactive participation from the staff members during the meeting.

The meeting commenced with opening remarks by the Chairman and Members. Member Secretary, RC welcomed the Chairman and Members of the RC, and invitees. Director, CSIR-CECRI in his initial remarks thanked RC Chairman and Members for providing valuable inputs during the 73rd RC which provided new directions and restructuring of R&D. Also, he highlighted the institute's significant activities since previous meeting. Further, Chairman congratulated the Team CECRI for their efforts and for the elaborative agenda prepared for the 74th meeting as well the minutes of the 73rd meeting.

RC Chairman stated that CSIR-CECRI is the leading and core research institution in the area of electrochemical science and technology in the country, and has a strong role to play in meeting the objectives of National missions and must showcase its capabilities at international level. He stressed the importance of systematic evaluation of areas/ technologies where the institution could make maximum impact at national/international levels - whether commercial, strategic or in fundamental science areas - and then taking them up in a focused and time bound manner, from perspective of providing complete solutions to the end users.







The Chairman expressed happiness at efforts made by various divisions towards understanding of the market scenario/requirements and incorporating the same in their target setting and work.

Prof. Vijayamohanan Pillai, Chair, Chemistry & Dean (R&D), Indian Institute of Science Education and Research, Tirupati and former Director, CSIR-CECRI stated that CSIR-CECRI has the capability to provide solutions to many of the global challenges in the areas of energy, environment and healthcare using its strength on electrochemistry. He mentioned that focus should also be on electro-organic synthesis which is regaining its momentum in recent times. CSIR-CECRI's R&D should have visible and tangible outputs.

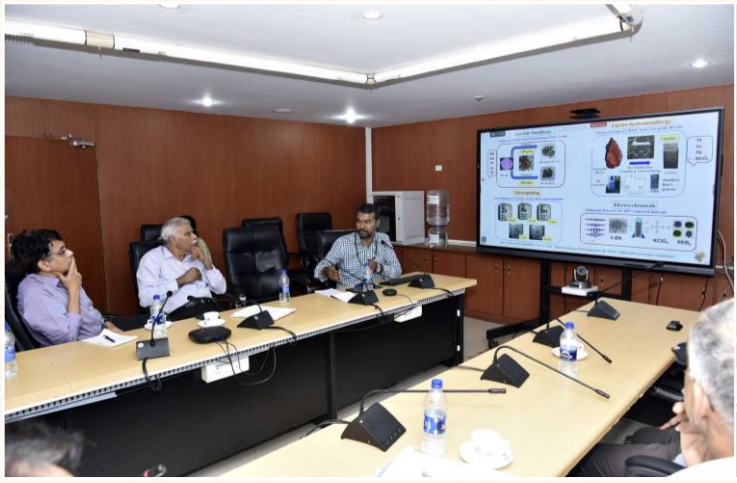
Prof. Raj Ganesh Pala, Department of Chemical Engineering, Indian Institute of Technology, Kanpur and Alumnus of B.Tech., CSIR-CECRI said that the Corrosion research may be projected as an impactful area by integrating with energy, health, AI/ML, and nanomaterials.

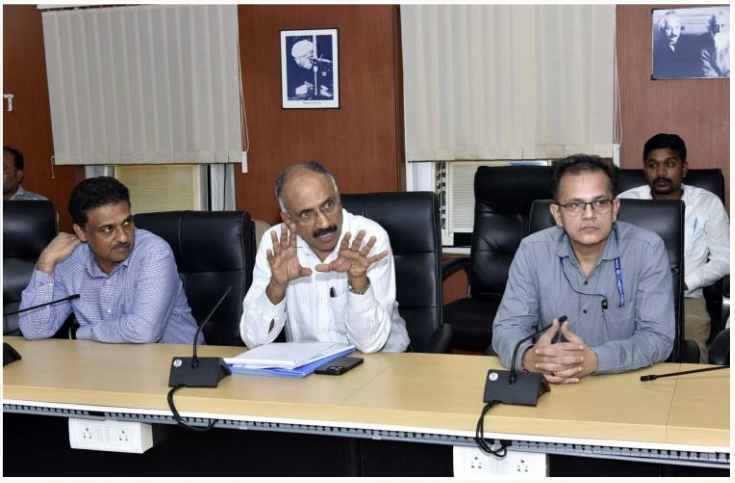
Prof. Arvind Kumar Mishra, Director, CSIR-CIMFR, Dhanbad applauded CSIR-CECRI's R&D capabilities and contributions in the areas of energy storage, corrosion, critical minerals, and environmental remediation & sustainability. **Dr. Mahesh Kumar,** Sr. Principal Scientist, Innovation Management Directorate, CSIR HQ, appreciated CSIR-CECRI for its contributions in on-going Mission Projects of CSIR.

Following the opening remarks, **Dr. K. Ramesha**, Director, CSIR-CECRI made a detailed presentation on the significant happenings in the Institute since the previous RC Meeting on March 5, 2024. He solicited the continued support and guidance of the RC in the future endeavours of CSIR-CECRI as well.

All the Heads of Divisions then made presentations on the recent progress made which were critically reviewed by the RC. Presentation by PIs of Special Projects (Mission, CFE, AcSIR, Skill Development, Jigyasa, etc.) and R&D seed fund (RDSF) Projects also ensued.

RC Chairman & Members gave valuable suggestions and inputs especially on the path ahead for CSIR-CECRI towards global glory. The Meeting concluded with remarks by the Chairman of the Research Council.





Business Development Leads

- Meeting with IOCL [Nov 6]
- Meeting with the DRDL Team [Nov 7]
- Meeting with CSIR-URDIP and CSIR-IPU [Nov 8]
- AI Mission Review Meeting [Nov 14]
- H_2T Project - Internal Review Meeting [Nov 18]
- Discussion with officials from Navin Fluorine International Limited [Nov 18]
- Discussion with Scientists from Shriram Institute for Industrial Research, Gurugram [Nov 26]
- Meeting with VSSC, Trivandrum [Nov 29]

Technology Transfer

- Manufacturing of Epoxy and Polyurethane paints for Coating of Concrete Structures to M/s. Kansai Nerolac Paints Limited, Mumbai [Nov 1]
- Process for Fabrication of 2.7 V, 150 F Cylindrical Supercapacitor Using Water-based Binder to M/s. Super Electro Green Technology Private Limited , Haryana [Nov 9]

NDA Signed

- Life Cycle Prediction of Lithium Ion Phosphate Cell - M/s. Euler Motors Private Limited, New Delhi
- Research Collaborations on Electrolytic Synthesis of White Phosphorus Preparation - M/s. Excel Industries Limited, Mumbai

Patent Filing Activity Meeting

A Patent Filing Activity Meeting was organized by a Team of Mentors from CSIR-Unit for Research and Development of Information Products (CSIR-URDIP), Pune and CSIR-Innovation Protection Unit (CSIR-IPU), New Delhi at CSIR-CECRI, Karaikudi on November 8 & 9, 2024 for the benefit of researchers here. Detailed presentations were made on 1) Patentability, Freedom-To-Operate and Techno-Commercial Evaluation and 2) Awareness on Patents Versus Other Types of IP (Copyrights, Trademarks, Designs, Geographical Indications etc.), Invention Disclosure Forms, Patent Filing, Patent Prosecution.

Exclusive break-out sessions with CSIR-CECRI Scientists / PIs / Inventors on ongoing inventions for new proposed patent filings for 2024-25 were conducted which were immensely beneficial and insightful for the research community of CSIR-CECRI. At the valediction, a summary review of outcomes on the pending filings to be completed and new proposed patent filings by the IP Coordinator, CSIR-CECRI was made. The event concluded with closing observations and remarks by Director CSIR-CECRI and Dr. Kishore Sreenivasan, Head CSIR-URDIP and feedback from the participants.

Ayurveda Day Celebration

The 9th Ayurveda Day was celebrated at CSIR-CECRI Karaikudi with the theme "***Ayurveda Innovation For Global Health***" designated by the Ministry of Ayush, Govt of India. A special **Ayurveda Medical Camp** was organized on November 11, 2024 at the Health Centre, CSIR-CECRI in collaboration with **AVN Arogya Ayurvedic Hospital** (***first Ayurveda NABH Accredited Hospital in Tamil Nadu***), Madurai. A large number of Staff and their Family Members, Pensioners, Scholars, contractual staff members and B.Tech. Students utilized this unique opportunity and consulted the external experts on their ailments.

Official Events

- Walk-in Interview for Apprentice [Nov 11]
- Assessment Committee Meeting for Technical Staff Members [Nov 15]
- Meeting with HODs on IISF-2024 Activities [Nov 14]
- iSAEST-13 Organizing Committee Meeting [Nov 18]
- iSAEST-13 Technical Committee Meeting [Nov 5, 29]
- Students Academic Committee Meeting [Nov 18, 19]
- Dissertation Project Work Allotment Committee Meeting [Nov 20]
- Patent Evaluation Committee Meeting [Nov 20]
- Projects Monitoring Committee Meeting [Nov 22]
- iSAEST-13 : Souvenir Committee Meeting [Nov 22]
- RIO Inspection Preliminary Meeting (Hindi) [Nov 25]
- TOLIC and OLIC Meeting [Nov 29]
- Observance of Communal Harmony Campaign Week and Fund Raising [Nov 19-25]. National Integration Pledge was also taken by all Staff Members on November 25, 2024.

Recent Research Projects Sanctioned

Industry Funded:

- Corrosion Failure Analysis and Mitigation Strategies for LPG Cylinders: Enhancing Durability and Safety, LPG Equipment Research Centre (LERC), Bangalore, Rs. 15.10 Lakhs, 6 Months w.e.f. 23-10-2024 [SSP 15/24]
- Lithium Ion Cell Characterization, M/s. Matter Energy Pvt. Ltd., Gujarat, Rs. 3.06 Lakhs, 6 months w.e.f. 29-10-2024 [TSP 09/2024]
- Life Cycle Prediction of Lithium Ion Phosphate Cell, M/s. Euler Motors, New Delhi, Rs. 1.31 Lakhs, 2 Months w.e.f. 20-11-2024 [TSP 11/2024]

PSU Funded:

- Tailor Made Physical Training Course on *Cross Country Pipelines Cathodic Protection and Survey Methods* for Bharat Petroleum Corporation Limited (BPCL), Cochin, Rs. 7.08 Lakhs, 2 Months w.e.f. 25-10-2024 [TSP 10/2024]

Govt Funded:

- Development of Polymer Electrolyte Membrane Based Air-cooled Fuel Cells for Hydrogen Mitigation During Cold Trap Regeneration, Board of Research In Nuclear Sciences (BRNS), Department of Atomic Energy (DAE), Mumbai, Rs. 40.54 Lakhs, 36 Months w.e.f. 16-11-2024 [GAP 16/2024]

CFE and AcSIR Highlights

- Shortlisting Committee Meeting for PhD under AcSIR - January 2025 Session [Nov 5]
- AcSIR Ph.D. Students Presentation on SMD Course [Nov 7]
- PhD Viva Voce Examination for Mr. S. Sudalaimani, AcSIR Scholar - Thesis Title: *Electrified liquid-liquid interface strategies for sensing non-redox molecules* (Supervisor: Dr. K. Giribabu) [Nov 11]
- DAC-III Meeting for Mr. S. Michelraj, AcSIR Scholar (Guide: Dr. V. Ganesh) [Nov 19]
- Faculty Lecture Series – Lecture by Dr. P. Murugan [Nov 23]
- Examination for AcSIR-IDDP PhD Scholars [Nov 28]
- III DAC Meeting for Mrs. V. Jayasudha, AcSIR Scholar (Guide: Dr. M. Pandiaraj) [Nov 28]
- PhD Viva Voce examination for Ms. S. Jayachitra, AcSIR Scholar - Thesis Title: *Exploring Chalcogenides-based Nanomaterials as Co-catalyst for Enhanced Photocatalytic Hydrogen Production over TiO_2 Photocatalyst* (Guide: Dr. P. Murugan) [Nov 29]
- B.Tech. Students' Placement Interviews [Nov 27,29]

Skill Development Activities

Skill Development Training Programmes:

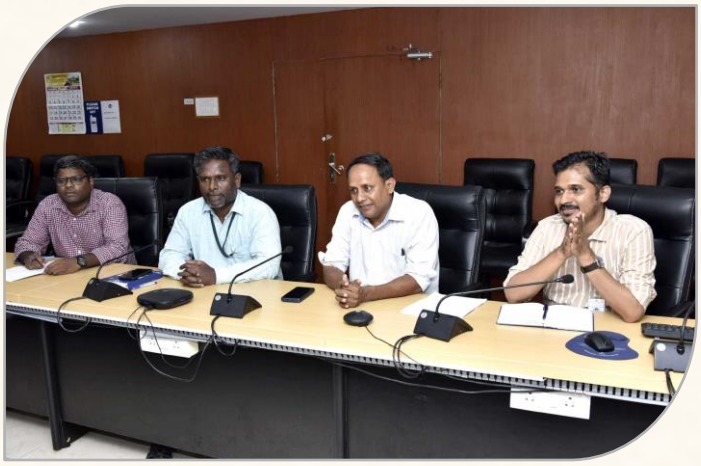
- A Skill Development Training Programme on ***Electrochemical Power Systems: Lead-acid battery - Care and Maintenance*** was organized by CSIR-CECRI during November 4-8, 2024. 29 participants undertook this training.
- A Skill Development Training Programme on ***Artificial Intelligence by using Microcontrollers*** was organized by CSIR-CECRI during November 18-22, 2024. 38 participants from all over Tamil Nadu got trained in this programme.
- A Tailor-made physical training course on ***Cross Country Pipelines Cathodic Protection and Survey Methods*** was organized by CSIR-CECRI during November 18-22, 2024 exclusively for delegates from BPCL. 22 Engineers/Executives from BPCL Units all over India actively participated.

Under the **CSIR-JIGYASA** Banner, the following events were organized by Jigyasa Group, CSIR-CECRI during November 2024:

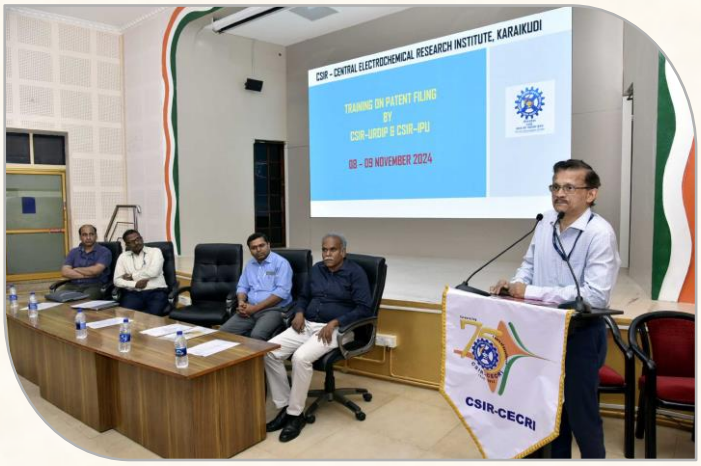
- As a part of India International Science Festival (IISF-2024) Outreach Programme, a ***Popular Science Lecture Series*** by Scientists of CSIR-CECRI was organized on November 9, 2024 at CSIR-CECRI, Karaikudi: 1) *Storage Systems for Renewable Energy* by Dr. P. Ragupathy, 2) *Healthcare Innovations* by Dr. V. Murugan and 3) *Green Hydrogen* by Dr. R. Malini. A large number of school students and teachers attended the lectures and got valuable insights.
- **4th Janjatiya Gaurav Divas Celebration** - Dr. R. Malini, Scientist, CSIR-CECRI delivered a talk on Strategies for Clean Air & Water (Online) [Nov 25]. 60 participants (from 3 schools) took part online.

Snapshots

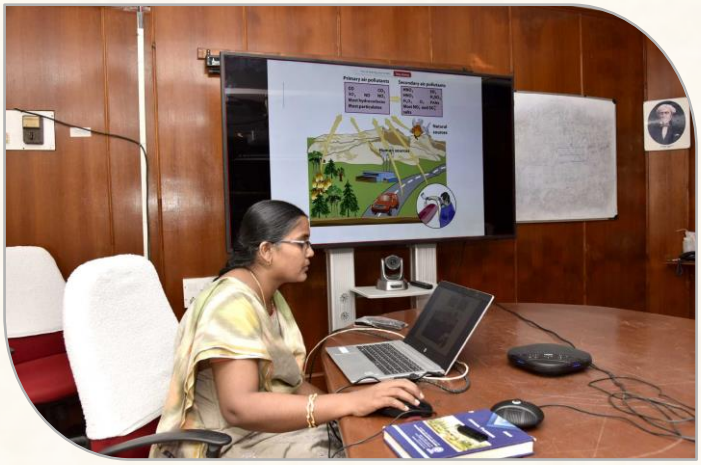
Training course on Cross Country Pipelines Cathodic Protection and Survey Methods for BPCL



Discussion with DRDL

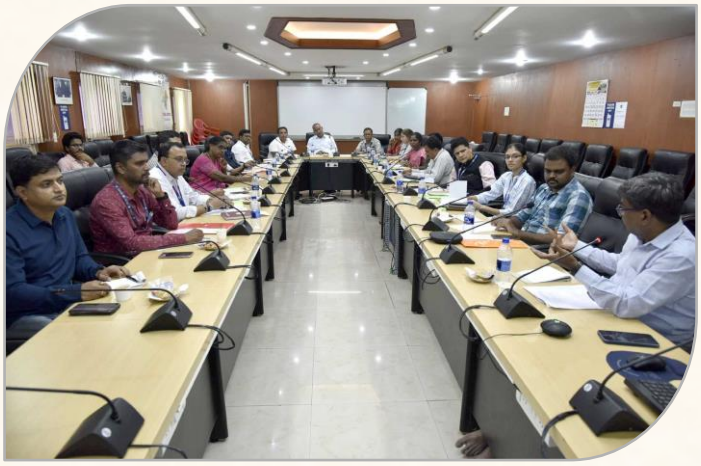


Patent Filing Activity Meeting

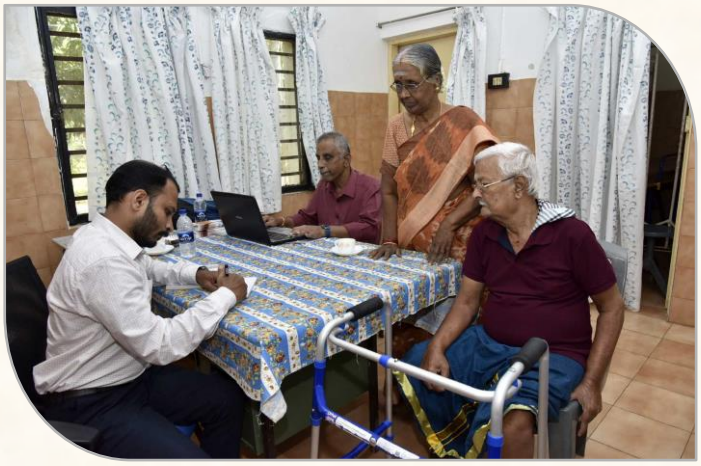


Janjatiya Gaurav Divas Celebration

Placement Interview for B.Tech. Students



TOLIC Meeting



Ayurvedic Medical Camp

TECHNOLOGY COMPENDIUM OF CSIR-CECRI

- Indigenous Li-ion battery
- Indigenous Sodium Ion Battery
- Performance Improved Lead Acid Battery
- CO_2 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 CO_2 and butadiene to Adipic Acid; CO_2 to Formic Acid; CO_2 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 KIO_3
- 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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