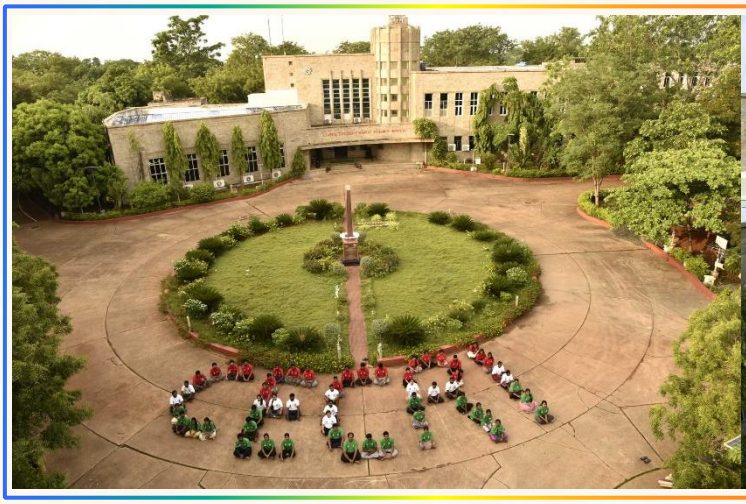
CECRI NEWS

(A monthly newsletter of CSIR-CECRI)

June 2024 Vol. 5 Iss. 6

10th International Day of Yoga

The **10th International Day of Yoga** (IDY) was celebrated at CSIR-Central Electrochemical Research Institute (**CSIR-CECRI**), Karaikudi in a vibrant manner on June 21, 2024. On December 11, 2014, the United Nations General Assembly designated June 21 as the **International Day of Yoga**. Since then, millions of people around the globe, united by the practice of yoga, have celebrated this day each year. This global celebration fosters unity and harmony, transcends borders and cultures, and brings us closer to a world of peace and well-being. Yoga brings the harmony between mind and body, makes a balance between thought and action, and integrates the body, mind, spirit, and soul. Every year, the IDY is being celebrated on the lines of a designated Theme and the Theme for IDY-2024 was ***Yoga for Self and Society***. Events commemorating this Theme were organized at CSIR-CECRI, Karaikudi in which a large number of staff members, scholars, students and family members took part with enormous enthusiasm.



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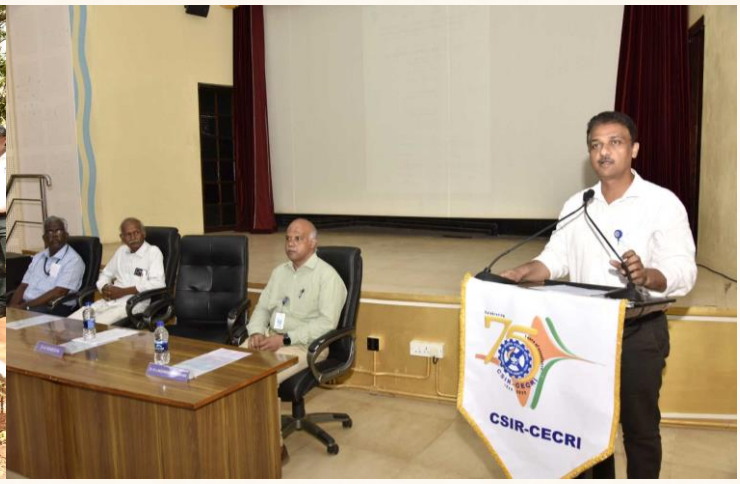


Practical Yoga Session by AcSIR Science Club, CSIR-CECRI:

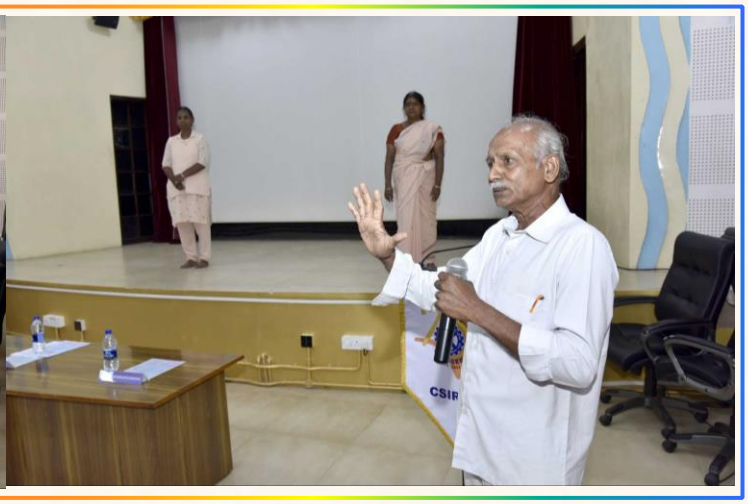
CSIR-CECRI welcomed the Yoga Day by having a morning practical performance by AcSIR Science Club of CSIR-CECRI under the natural sun light. Mr. N. K. Murugasenapathi, President, AcSIR Science Club, CSIR-CECRI welcomed the gathering. **Dr. K. Ramesha**, Director, CSIR-CECRI initiated the event with his initial remarks on the importance of Yoga that originated from our country. He welcomed and acknowledged the guest **Ms. B. Priya, Yoga Instructor, Mahayogam, Karaikudi**. The research scholars performed the various postures of yoga as detailed by the instructor who also explained the health benefits of the postures. **Dr. K. Giribabu**, Senior Scientist, CSIR-CECRI volunteered himself as the demonstrator of the yoga postures. The scholars dressed themselves in such a way to represent the tri-colour flag of the nation, ***tiranga***. The hour-long yoga practice ended with a vote of thanks by Ms. Rajalakshmi, Treasurer, AcSIR Science Club.

Rose Saplings Plantation by School Kids:

The kindergarten kids of Sishu Vidyalaya and Kendriya Vidyalaya, CSIR-CECRI Campus, Karaikudi made the 10th International Day of Yoga a memorable one by carrying out a **plantation drive of rose saplings** at Nehru Centenary Rose Garden in CSIR-CECRI Campus. **Dr. K. Ramesha**, Director, CSIR-CECRI presided over the event by joining the kids in planting the rose saplings. CSIR-CECRI administration has coordinated the event.

Special Lecture cum Demonstration:

The Yoga Day evening had a **special lecture and demonstration** by **Dr. A. Selvaraj and Team, Manavalakalai Mandram, Karaikudi** to the Staff and Students of CSIR-CECRI. **Dr. N. Lakshmi-narasimhan**, Senior Principal Scientist welcomed the gathering. **Dr. K. Ramesha**, Director, CSIR-CECRI provided the initial remarks in which he highlighted the origin of International Day of Yoga and the need of it at this time. **Dr. A. Selvaraj** in his lecture explained the importance of controlling mind through breathing practices and yoga postures for vital organs on maintaining a good health and sound mind. The volunteers from Manavalakalai Mandram, Karaikudi demonstrated few yoga postures to the audience. **Dr. P. Murugan**, Senior Principal Scientist proposed the vote of thanks. The event ended with the National Anthem. More than 150 participants got immensely benefited by this event.



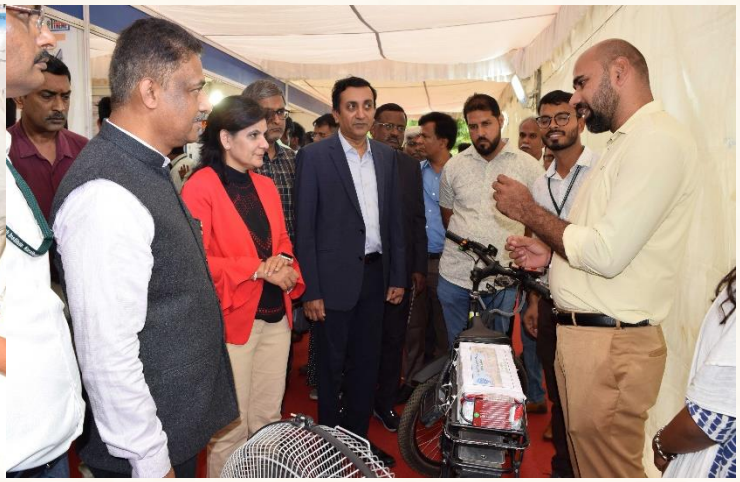
Event under One Week One Theme of CSIR

Consequent to the astounding success of the **One Week One Lab** programme of CSIR, CSIR-CECRI embarked on the journey of **One Week One Theme** of CSIR under which it was envisaged to showcase its expertise, achievements and ongoing R&D under CSIR's Thematic Area of ***Energy (Conventional and Nonconventional) and Energy Devices***. In this regard, a **Industrial Conclave** was organized on June 27, 2024 at CSIR-CECRI Chennai Unit, CSIR Madras Complex, Taramani, Chennai with an objective of laying an ideal platform for knowledge sharing, technical demonstrations, and identifying the gaps between research outcomes and societal needs. All stakeholders – policymakers, officials of regulatory bodies, government organizations, researchers were invited for this Industrial Conclave to share their expertise and views. The event was aimed at building a strong connect between CSIR-CECRI & Industries and to effectively contribute towards enhancing the energy infrastructure in the country and serve as a guide to focus on the future R&D activities towards developing innovative solutions to the emerging energy demands.

Dr. K. Ramesha, Director, CSIR-CECRI warmly welcomed the distinguished gathering of Scientists of CSIR and Industry Counterparts and highlighted CSIR-CECRI's pioneering research endeavors especially in the area of Energy and Energy Devices. Following this, **Dr. N. Anandavalli**, Director, CSIR-Structural Engineering Research Centre (CSIR-SERC) and Coordinating Director, CSIR Madras Complex (CMC), delineated the ongoing research at CMC with a special focus on advancements in structural engineering with significant societal implications. **Shri. R. Mukundan**, Managing Director and CEO of Tata Chemicals graced the occasion as the Chief Guest and in his address, reflected on the enduring partnership between Tata Chemicals and CECRI, emphasizing the Institute's contributions in asset management and recent strides in energy storage technologies. He underscored the pivotal role of public-private partnerships in fostering innovation and achieving tangible outcomes. Later, **Dr. Nagahanumaiah**, Director, Central Manufacturing Technological Institute (CMTI), Bengaluru, emphasized the importance of indigenous machinery production to bolster India's manufacturing sector, aligning with the national initiative of Make in India.

Shri. Srivats Ram, Chairman of Confederation of Indian Industry (CII) Tamil Nadu State Council and Managing Director of Wheels India Ltd., gave insights on the significance of collaborative research and development efforts, stressing the need for patience and understanding in nurturing fruitful industry-research partnerships. **Dr. Gayatri Dadheech**, Chief Technology Officer of Exide Industries Ltd., provided an overview of Exide's initiatives, notably highlighting the upcoming Gigafactory for lithium-ion batteries, indicative of significant strides in energy storage solutions. The inaugural session concluded with a Vote of Thanks by **Dr. Alok K R Paul**, Scientist-in-Charge, CSIR-CECRI Chennai Unit, CMC.

The subsequent technical sessions delved deep into pertinent themes. The session on Battery Technology for E-Mobility chaired by **Dr. Kuldeep Singh**, CSIR-CECRI underscored the critical advancements in battery technology pivotal for accelerating electric mobility. Speakers, including **Dr. Rajesh Makkat** R&D Director, Ola electric and **Dr. Ashwani**, CTO of Cellark discussed India's ambitious targets in lithium-ion battery production and indigenous material developments, emphasizing sustainability and technological innovation. **Dr. A.S. Prakash** from CSIR-CECRI presented the status of development on the CSIR-Battery Technologies.



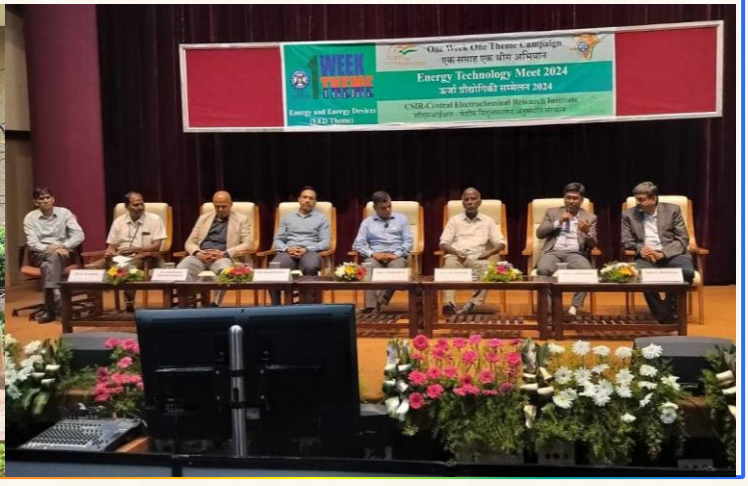
The event also featured the ***Fuel Cell Technology*** session chaired by Dr. A.K. Sahu, CSIR-CECRI where experts including Dr. N. Murugesan, Scientist-F, IGCAR, Kalpakkam, Dr. Sankararao Mutyala, Director, Nanosol Energy Pvt. Ltd and Dr. S.D. Bhat, CSIR-CECRI explored hydrogen management, fuel cell applications, and ongoing research advancements. Discussions on polymer electrolyte membrane fuel cells and industry collaborations highlighted the promising future of fuel cell technology in achieving sustainable energy solutions.

The session on ***Cost-effective Electrolyser Technology*** for clean hydrogen production, chaired by Dr. Vishal Dhavale, CSIR-CECRI showcased innovative approaches and collaborative efforts towards advancing hydrogen technologies. Presentations by industry leaders like Dr. Chockklingam Karuppiah, CTO, Ohmium International and Dr. R. Balaji, Centre for Fuel Cell Technology (CFCT), Chennai underscored the potential for technological integration and knowledge-sharing to drive progress in hydrogen production.

Finally, the Event ended with a Panel Discussion on ***Energy Horizons: Pioneering Technologies for India*** which was moderated by Shri. V. Manjunath from UL Labs Bangalore. Dr Yashodhan Pramod Gokhale, Vice-President, Battery Technologies, JSW Energy, Mumbai, Dr. Velayutham, Head, Fuel Cell Division, Anabond Ltd., Chennai, Shri. G. Parthiban, DGM, BGR Tech Ltd., Chennai, Shri. G. Srinivasan, Vice-President, Waree Energies Ltd., Gujarat, Shri Rathor, Gujarat Fluro Chemicals and Dr. Murugesan from IGCAR comprised the Expert Panel.

An exclusive Exhibition of technologies & products of CSIR-CECRI was arranged during the Industrial Conclave which drew lot of attention from a large number of participants as it provided a tangible demonstration of energy devices' capabilities, showcasing fuel cells, batteries, electrolyzers and the components critical for sustainable energy solutions. Live demonstrations and detailed explanations highlighted the efficiency and applicability of these technologies across various sectors.

Overall, the OWOT Event served as a vibrant platform for dialogue, collaboration, and knowledge exchange among researchers, industry leaders, and policymakers paving the path for a sustainable energy future.



ULSE – CSIR-CECRI Workshop

A one day Workshop on ***Standards throughout the value chain of Lithium-ion Batteries used in EV and BESS*** was organized by **UL Standards & Engagement Inc. (ULSE)** in collaboration with **CSIR-CECRI** on June 26, 2024 at CSIR-CECRI Chennai unit with an aim to address the crucial safety and sustainability challenges associated with Lithium-ion batteries across their entire value chain.

Dr. K. Ramesha, Director, CSIR-CECRI inaugurated the Workshop and in his Inaugural Address, he highlighted the significance of regulatory measures to be followed in any batteries application specially in the critical area of EV and Energy Storage which requires extra care and experienced expertise. He also thanked ULSE for joining hands with CSIR-CECRI in organizing this timely Event.

The Workshop delved into key technical aspects such as thermal management, battery management systems, thermal runaway mitigation, repurposing, and recycling of LiB. Distinguished speakers and eminent experts from various sectors, including CSIR-CECRI, ULSE, the EV and LiB industries, and academia (IIT Madras, University of Madras, Anna University, NITs, and SRM University), shared their valuable insights. Experts emphasized on the importance of standards in ensuring the safe deployment of LiB technology in electric vehicles (EV) and Battery Energy Storage Systems (BESS) in India.

Over 50 industry participants actively engaged in the Workshop, fostering a collaborative environment for knowledge sharing among stakeholders in the LiB ecosystem. This event significantly contributed to a deeper understanding of the challenges and opportunities related to LiB safety and sustainability, paving the way for developing and implementing robust standards to support the growth of the EV and BESS sectors in India.

Skill Development Activities

Skill Development Training Programmes:

- A Skill Development Training Programme on ***Basics of High Resolution Imaging Techniques and their Application to Science and Technology*** was organized by CSIR-CECRI during June 3-6, 2024. 51 participants underwent training in this programme.
- A Skill Development Training Programme on ***Paints and Coatings for Corrosion Protection*** was organized by CSIR-CECRI during June 10-4, 2024. 49 participants took part in this training programme.

JIGYASA:

- Lab Nodal Committee had visited various divisions of CSIR-CECRI on June 6, 2024 to implement **Reduce Energy Challenge and Energy Literacy Training (REC-ELT)** Campaign for the staff of CSIR-CECRI. In addition, an awareness talk was also arranged to increase awareness on Reduce Energy in all possible ways at our Lab/Home and to achieve 100% completion of Energy Literacy Training by CSIR-CECRI staff members.
- **Dr. N. Kalaiselvi, Director General, CSIR** inaugurated the Kick-off of Summer Internship under **CSIR Jigyasa EPIC HACKATHON 2024** and delivered an inspiring address (Online). 85 Students and 4 Teachers from Oxford Matriculation Higher Secondary School, Pattukkottai attended this Event at CSIR-CECRI and made a visit to R&D labs and facilities.

Recent Research Projects Sanctioned

Industry Funded:

- Extraction of Mg from $MgCl_2$ given by Tuticorin Bio-Energy through Molten Salt Electrolysis, M/s. Tuticorin Bio-Energy, Tuticorin, Rs. 1.20 Lakhs, 2 months wef 06-05-2024 [TSP 03/2024]
- Tailor-made Physical Training Course on *Cross Country Pipelines Cathodic Protection and Survey Methods* for M/s. Bharat Petroleum Corporation Limited (BPCL), Kochi, Rs. 7.08 Lakhs, 2 months wef 26-06-2024 [TSP 04/2024]

Govt-Aided Projects (GAP):

- Design and Development of Lithium-ion Batteries and Demonstration of 1.5 KWh battery pack for EV Application, Department of Science & Technology (DST), Rs. 185 Lakhs, 3 years wef 21-05-2024 [GAP 10/2024]

CSIR Funded:

- Development of Highly Efficient Visible Light Driven Photo Catalyst: A Thin Film Approach for Solar Hydrogen Production, Rs. 50 Lakhs, 2 years wef 25-06-2024 [FBR 060301]
- Ultra-Low Platinum Alloy Catalyst for Polymer Electrolyte Membrane Fuel Cells, Rs. 77 Lakhs, 2 years wef 25-06-2024 [NCP 060302]
- State of Health Forecasting of Battery using AI methods, Rs. 54 Lakhs, 2 years wef 25-06-2024 [FBR 060303]

Business Development and CSIR Theme Leads

- CSIR RDSF Project Monitoring Meeting [June 10]
- Project Kickoff Meeting with High Energy Batteries Ltd. [June 11]
- Meeting with Officials of Siemens Digital Industries Software [June 12]
- Monthly Review Meeting - FBR 080302W1 [June 12]
- Monthly Review Meeting - GAP 02/24 [June 12]
- Discussion with GFCL Solar and Green Hydrogen Products Ltd., Gujarat on Green Hydrogen [June 13]
- Meeting on Evaluation of Innovation Excellence [June 13]
- Review Meeting on MLP 0407 [June 14]
- NSTL Project Review Meeting [June 21]
- Meeting with Dr. Concrete [June 28]

CFE and AcSIR Highlights

- II DAC Meeting for Mr. M. Manivannan (Guide: Dr. V. Suryanarayanan) [June 6]
- Counselling/Interview for admission to PhD and IDDP Progam [June 12]
- PhD Synopsis Submission of Mr. A. Esokkiya (Guide: Dr. K. Giribabu) [June 14]
- PhD Viva-Voce Examination for Ms. S. Sathya (Guide: Dr. A. Manuel Stephan) [June 19]
- Meeting of the Students Academic Committee [June 20]
- PhD Viva-Voce Examination for Mr. Anup Kuchipudi, AcSIR Scholar (Guide: Dr. G. Sreedhar) [June 24]
- PhD Viva-Voce Examination for Ms. P. Aarthi, AcSIR Scholar (Guide: Dr. S. Ravichandran) [June 25]
- III DAC Meeting of Mr. Krishendu Bera (Guide: Dr. Subrata Kundu) [June 26]

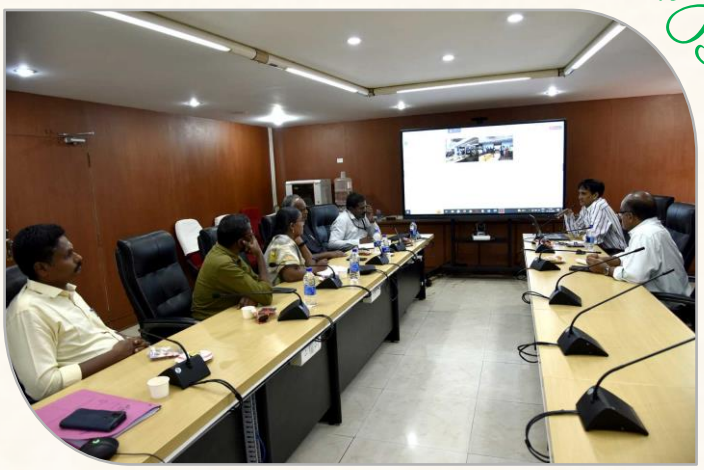
Official Events

- Laboratory Strategic Group Meeting [June 6]
- Annual Report Committee Meeting [June 7]
- Hindi Praveen Examination and Viva [June 10]
- Meeting with the Office of the Principal Scientific Advisor, GOI [June 11]
- Hindi Pragya [June 11] and Prabodh Exam [June 13]
- REC and ELT Campaign [June 11]
- Hindi Prabodh Exam [June 13]
- Selection Committee Meeting for engagement of Project Personnel [June 19, 20]
- EC Meeting of CECRI Ladies Forum [June 21]
- Felicitation and Farewell to Retirees [June 28]

Cardiology Medical Camp

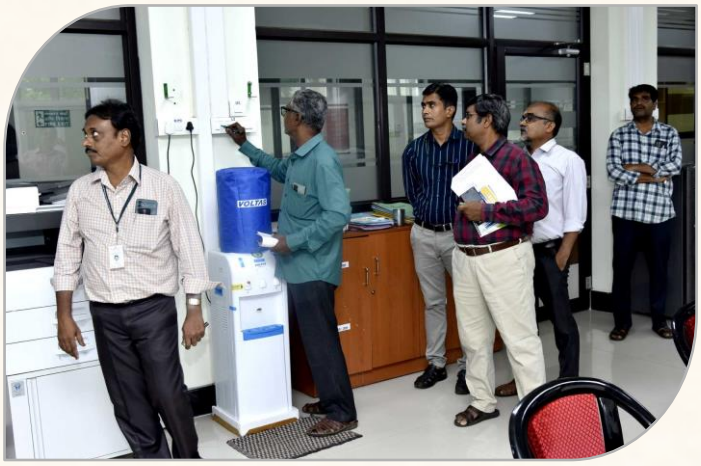
CSIR-CECRI in association with Apollo Hospitals, Managiri, Karaikudi organized a Cardiology Medical Camp on June 28, 2024 for the benefit of CSIR-CECRI Staff, Pensioners and their Family Members. Dr. M. Ranga Manikandan, MD (Gen. Med.), DM (Cardio), DNB (Cardio), Apollo Hospitals was the Chief Consultant. A large number of patients consulted him after ECHO and ECG tests.

Snapshots



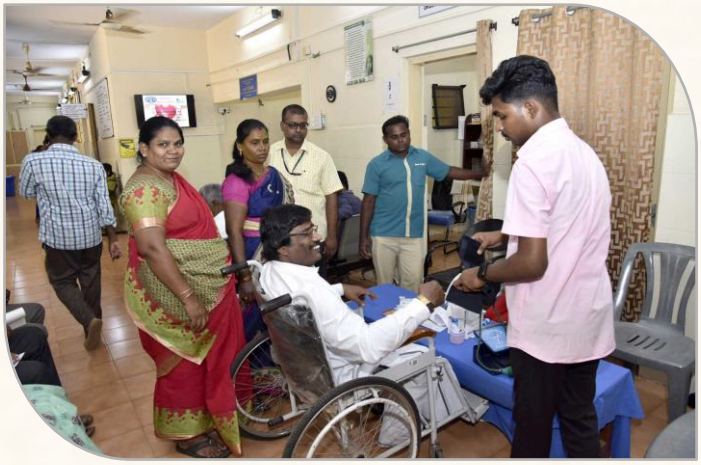
Meeting with GFCL

Discussion with Siemens Digital Industries Software

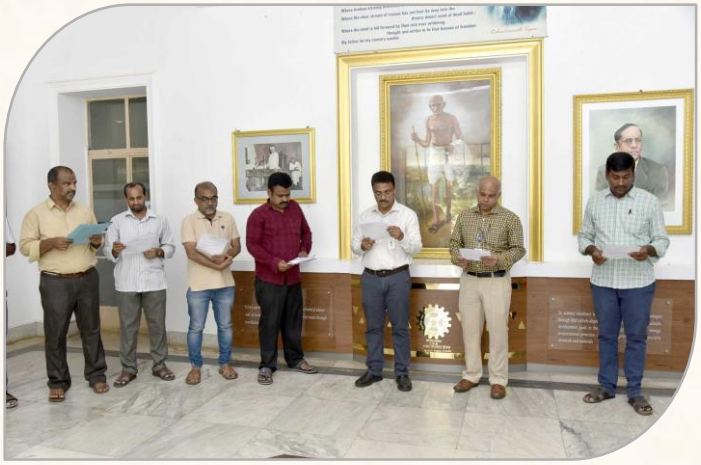


REC-ELT Campaign

Lab Visit by School Students under CSIR Jigyasa



Cardiology Medical Camp



World Blood Donor Day Pledge

Felicitation and Farewell to the Retirees

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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