



CECRI NEWS

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

New Year 2023 Celebrations

CSIR-Central Electrochemical Research Institute (CSIR-CECRI), Karaikudi, in its 75th Foundation Year, welcomed the New Year 2023 in a grand manner. On 2nd January 2023 (forenoon), Dr. N. Kalaiselvi, Director General, Council of Scientific and Industrial Research (CSIR) and Secretary, Department of Scientific and Industrial Research (DSIR) gave a pep talk to the members of CSIR and DSIR fraternity. In her address, she highlighted CSIR's Vision to be the **Nodal and Model for Global Science, Technology and Innovation**. She narrated the proud moments of CSIR during 2022 - highlighting purple revolution under aroma mission, floriculture mission, India's first indigenously developed Hydrogen Fuel Cell Bus, Steel Slag Roads, Lithium-Ion Batteries producing facility, etc.- and congratulated the entire CSIR family for the perseverant efforts leading to positive and fruitful results.



EDITORIAL BOARD

Dr. N. Lakshminarasimhan
 Chairman

MEMBERS:

Mr. KR. Karupiah
 Mr. S. Gunasekaran
 Mr. M. Jayakkannan
 Mr. T. Ashok Balamurugan

“

*CSIR envisions to be the
 Nodal and Model for
 Global Science, Technology
 and Innovation*

- Dr. N. Kalaiselvi
 Director General, CSIR
 and Secretary, DSIR

”

INSIDE THIS ISSUE

- New Year 2023 Celebrations
- Launch of One Week One Lab Campaign
- Technology Transferred/ MoU Signed
- Activities under Jigyasa
- Honours and Awards

Proud Moments of DSIR

Ministry of Science and Technology
Department of Scientific and Industrial Research

'PRISM'
(Promoting Innovations in Individuals, Start-ups and MSMEs)

Focus Areas of Capacity Building for Women

Proud Moments of CSIR

Lithium-Ion Batteries
producing facility

Dr. Kalaiselvi highlighted DSIR's activities under the banner of **PRISM** (Promoting Innovations in Individuals, Start-ups and MSMEs) and the significant outcomes under this initiative. She also highlighted the activities and achievements of National Research Development Corporation (**NRDC**) and Central Electronics Limited (**CEL**) especially NRDC's gear shifting initiatives and the maiden payment of CEL's Dividend to the Govt. of India.

put forward timeline-based work flow of all official activities with timely inspections in-between. She detailed on the expectations out of all members of the DSIR family and called for unified efforts towards realizing the ultimate goal of **One DSIR for One Nation**.

Dr. K.J. Sreeram, Director, CSIR-CECRI addressed the CECRI fraternity in the afternoon. He reminisced CECRI's achievements in 2022 and envisioned the path-forward activities for 2023. He also wished many more laurels in the new year.

NRDC: Shifting Gears
Promote Technological Innovation, IP promotion & Commercialisation

NRDC Outreach Centres:

- Pune: **Inaugurated in Dec 2022**
- Guwahati: **Planned in Jan 2023**

Start-up Support- Capacity Buildup:

- Three Incubation Centres: NRDC HQ, NAL, IMMT
- TDVC & Seed Funding Scheme **operationalised**

Foreign Collaborations:

- MoU signed : USPTO, AARDO
- In process: WIPO Green, CNRST Morocco



On this occasion, **Annual Planner, Monthly and Daily Calendars** brought out by **CSIR-CECRI Club** were released by **Dr. V. Saraswathy**, Chief Scientist and Head, Corrosion and Materials Protection Division, CSIR-CECRI.

Proud Moments of CEL

CEL Dividend
paid for the first time to GoI

Dr. Kalaiselvi also briefed on the outcomes of the CSIR Society Meeting, CSIR Directors' Conference, CSIR Governing Body Meeting and CSIR Leadership Meet held during 2022. She stressed on the need to strengthen the visibility and outreach activities of DSIR including the flagship event of **One Week One Lab** programme propounded by Dr. Jitendra Singh Hon'ble, Minister of Science and Technology, GOI. Dr. Kalaiselvi



Launch of CSIR's One Week One Lab Campaign



Union Minister and Vice-President of CSIR, **Dr. Jitendra Singh** launched the **"One Week One Lab" Campaign** at New Delhi on January 6, 2023 which is aimed at highlighting India's global excellence in technology, innovation and StartUps. This exclusive campaign will showcase the legacy, exclusive innovations and technological breakthroughs of each CSIR lab through week long events including industry & start-ups meet, students connect, society connect, display of technologies, etc. He said that all **37 CSIR Labs in India will be turned into Global Centers of Research and Innovation** in their respective fields of Specialization.

Dr. Jitendra Singh pointed out that with the active and constant support of **Hon'ble Prime Minister Shri. Narendra Modi** for all scientific endeavours since May 2014, India is scaling new heights each day in Science, Technology, Innovation (STI) eco-system. He informed that in the last decade, **CSIR** has facilitated the country with its first ever Biofuel-Powered Flight, Bharatiya Nirdeshak Dravya, Asafoetida (Heeng) cultivation, indigenous development of dental implants, the technology of High-Resolution Aquifer Mapping, indigenously developed Hydrogen Fuel Cell Bus, road construction with Steel Slag, development of CSIR-TechnoS Raman Spectrometers, the Trainer aircraft HANSA-NG and many other technologies.

The Hon'ble Minister was happy to note that each of 37 CSIR laboratories is unique and specializes in as diverse

areas as the Genome to Geology, Food to Fuel, Minerals to Materials, and so on. CSIR has marked its footprint in the Nation with pathbreaking technologies and innovations since last 80 years, some of them include the indelible ink, Parallel Computers Flosolver, Swaraj Tractors, Centchroman, DNA Fingerprinting, Aroma Mission and many other. He also pointed out that there is a *plethora of technologies developed by the Scientists and Researchers of CSIR laboratories for the society, but many of them remain confined to the laboratories*. There is a need to establish the resourceful connect of people (stakeholder/ entrepreneur/ student/ industry) to know more about the technologies for the advancement of the technology and the progress of the society, he added.

Dr. N. Kalaiselvi, Secretary, DSIR & Director General, CSIR, said the campaign is a unique initiation and an out of box idea of the Hon'ble Minister to reach out to people of India and to the world about the success stories of CSIR. Describing CSIR as the **Innovation Engine of India**, She said that all the 37 labs have to come out with lots of success stories in the next 7 Years for a mid-term appraisal in 2030, to fulfill the vision of Prime Minister to make India **Innovation Hub of the World in 2047**. She also informed that the campaign is to showcase the future technologies on which CSIR labs are working as well. *This Campaign will also provide an opportunity to create networks of Govt-Academia-Industry for faster deliveries and deployments of technologies*, she added.



Business Development Leads

- ❖ Interaction with **HLL Lifecare Ltd.** on R&D collaboration [Jan 5]
- ❖ Review Meeting on **Hydrogen Mission Mode Project (H2T)** [Jan 7]
- ❖ Discussion with **Adani Group** on Green Hydrogen [Jan 9]
- ❖ Discussion on **CSIR's RACE Facility for Green Crackers** (Raw materials/chemicals, Composition, Emissions testing facility) [Jan 11]
- ❖ Meeting with **NTPC** on R&D collaboration [Jan 13]
- ❖ Discussion with Shri. G. Naga Mohan, Secretary, **Tungabhadra Board** and his team members regarding Inspection by CECRI's Experts at Tungabhadra Dam, Karnataka [Jan 17]
- ❖ Meeting with **NEERI, Nagpur** regarding Smog Tower [Jan 18]
- ❖ Discussion with **NIOT** on green hydrogen generation by seawater electrolysis [Jan 19]
- ❖ Project Review Meeting with **Titan Tech** Bangalore Officials (SSP 26/21) [Jan 20]
- ❖ Online Meeting with **NLC** on R&D Collaboration [Jan 24]
- ❖ Meeting with **Indus Towers** on ongoing R&D activities [Jan 24]
- ❖ Meeting with **BHEL** on Green Hydrogen [Jan 27]
- ❖ Discussion on Carbon Capture with **Petronas** [Jan 31]
- ❖ Meeting with Regional Director, **Indus Towers** [Jan 31]

Technology Transferred / MoU Signed

Technology Transferred:

- ❖ *Electrochemical De-fluorinator for Drinking Water* to M/s. Balaji Construction, Raipur. 8.85 lakhs; 7 years wef 27.01.2023.

MoU Signed:

- ❖ Title : *Investigate ARi's materials in Lithium-ion and Sodium-ion Batteries and battery making know-how, thereof* M/s. Automotive Robotics (India) Pvt. Ltd., Hyderabad; 3 years wef 23.01.2023.

AcSIR Highlights

- ❖ PhD Viva Voce Examination for Ms. K.B. Bhojanaa, AcSIR Scholar (Guide: Dr. A. Pandikumar) [Jan 11]
- ❖ Upgradation Meeting (JRF to SRF) for Mr. Krishnendu Bera (Guide: Dr. Subrata Kundu) [Jan 11]
- ❖ Upgradation Meeting (JRF to SRF) for Ms. Jyothimol (Guide: Dr. Arunchandran) [Jan 18]
- ❖ JRF Extension Meeting for Ms. Packialakshmi & Mr. Nikhil Chandran (Guide: Dr. M. Sathish) [Jan 19]
- ❖ Upgradation Meeting (JRF to SRF) for Mr. Pardhasaradhi (Guide: Dr. S.K. Panda) [Jan 20]
- ❖ DAC Meeting for Mr. K. Mariyappan, AcSIR Scholar (Guide: Dr. P. Ragupathy) [Jan 24]
- ❖ DAC Meeting for Mr. R. Naresh, AcSIR Scholar (Guide: Dr. P. Ragupathy) [Jan 24]
- ❖ DAC Meeting for Mr. S. Shanmuga Sundaram, AcSIR Scholar (Guide: Dr. S.M. Senthilkumar) [Jan 25]
- ❖ DAC Meeting for Mr. Usman Lawal, TWAS Fellow (Guide: Dr. V. Ravibabu) [Jan 27]
- ❖ Synopsis (DAC-IV) Meeting for Mr. R. Vinoth, AcSIR Scholar (Guide: Dr. A.M. Vinu Mohan) [Jan 30]
- ❖ Meeting of the Student Academic Committee [Jan 30]

Official Events

- ❖ Meeting on "**One Week One Lab**" Campaign [Jan 3]
- ❖ Meeting of the Patent Review Committee [Jan 3]
- ❖ Walk-in-interview for engagement of Project Personnel [Jan 4]
- ❖ Distribution of Cash Award to Wards of Staff Members for excellence in Sports [Jan 6]
- ❖ Research Scholar Forum (RSF) Scientist Lecture Series - *Lithium-ion batteries futuristic energy storage* by M. Kowsalya [Jan 10]
- ❖ Hindi Training Workshop [Jan 12]
- ❖ Meeting of the Furniture Purchase Committee [Jan 18]
- ❖ Training on e-Office [Jan 18]
- ❖ Lecture on *3D Experience Software Solution Offerings on Electric Vehicles Battery Cell Engineering, Systems Simulation Vehicle Systems* by M/s. EDS Technologies, Coimbatore [Jan 30]

Honours and Awards

[Two Day International Conference on "Innovations in Medical Technologies"
organized by Dhanalakshmi Srinivasan University, Samayapuram, Tiruchirappalli (Jan 6-7, 2023)]



Dr. T. Boobalan, ICMR-Research Associate
[Supervisor: Dr. M. Pandiaraj]
Best Presentation - First Prize
Theme: Point-of-care Diagnostics



Mr. K. Venkatesan, AcSIR PhD Scholar
[Supervisor: Dr. Deepak Kumar Pattanayak]
Best Presentation - Second Prize
Theme: 3D Printing



Mr. Gaurav R. Pandey, AcSIR PhD Scholar
[Supervisor: Dr. V. Murugan]
Best Presentation - First Prize
Theme: Lab-on-a-Chip



Ms. P. Sriraja Subhasri, AcSIR PhD Scholar
[Supervisor: Dr. M. Pandiaraj]
Best Presentation - Third Prize
Theme: Point-of-care Diagnostics

Skill Development Activities under CSIR-Jigyasa

❖ **Popularization of Science Event on Testing of Food Adulteration** [Jan 3-4] - 75 Students from 75 Schools adopted under CECRI@75 took part in the programme.

❖ **Lab@School Programme:** Our Staff Members and AcSIR students visited the following schools and gave motivation lectures and practical demonstrations to ignite the passion for Science among students:

i) 1. Sri Sankara Vidyalaya, Karur; 2. Govt. Hr. Sec. School, Kullappanaickanur, Salem District; 3. Govt. Hr. Sec. School, Mimisel and 4. Govt. Hr. Sec. School, Kavarapatti, Pudukottai District [Jan 10].

ii) Kendriya Vidyalayas in Chennai Region - 1. Vidyodaya Girls HSS, T. Nagar; 2. KV, Meenambakkam; 3. KV, IIT; 4. KV, CLRI; 5. KV, Anna Nagar; 6. KV, Island Grounds; 7. KV, Ashok Nagar; 8. KV No. 1, Kalpakkam; 9. KV, Karaikkal and 10. KV No. 1, JIPMER [Jan 19].

iii) 1. Govt. High School, Kalasambadi; 2. Govt. Girls Hr. Sec. School, Vedaranayam; 3. Sri Gurugnanasambandar Hr. Sec. School, Mayiladuthurai and 4. CSI Hr. Sec. School, Nagapattinam [Jan 21].

❖ **Two days Workshop** by AcSIR Scholars for their societal project on "**Solar Energy Materials**" [Jan 23-24]. An elocution competition for students and prototype model competition for teachers were also conducted. More than 100 students and 25 teachers participated.

❖ **Workshop on "Surface Engineering"** for PG college students [Jan 25]. More than 50 students attended.

❖ A new series of talks on scientific talks (*in Tamil*) was initiated this year - **Vigyana Vinthai** programme in Alagappa University Community Radio [90.8 FM]. So far, 11 of our staff members have delivered their talks.



Azadi Ka Amrit Mahotsav and CSIR-CECRI@75

As a part of the ongoing Lecture Series on '*Electrochemical Science and Technologies: A Path Forward to Sustainable Society*' in marking the celebrations of India's 75th Year of Independence (Azadi Ka Amrit Mahotsav) and CSIR-CECRI's 75th Foundation Year (CSIR-CECRI@75) three lectures were organized during January 2023:

On January 9, 2023, **Dr. S.V. Eswaran**, Former Head, Department of Chemistry & Dean, St. Stephen's College, University of Delhi delivered a lecture on **Value Added Products from Soil, Coal and Municipal City Solid Waste**. In his talk, he explained in detail on how the Click chemistry could be used to synthesize a series of biaryl-based bis(1,2,3-triazoles) and other polymers (which possess high antifungal activities - evaluated against three soil-borne plant pathogenic fungi, viz. *Rhizoctonia bataticola*, *Sclerotium rolfsii*, and *Fusarium oxysporum*, using the food poison technique. He also detailed the precise estimation of the degree of derivatization of functional groups in polymers which is critical in determining their macroscopic properties through 1-D and 2-D NMR experiments. He also highlighted the challenges associated with the huge solid waste accumulation and burning of such waste in and around our capital city of Delhi leading its way to the list of most polluted cities in the World.

Dr. K. Jeganathan, Professor & Head, Department of Physics and Director, Center for Nanoscience and Nanotechnology, Bharathidasan University, Tiruchirappalli delivered a lecture on the topic **III-Nitride Semiconductor Nanostructures and their Applications** on

January 11, 2023. Dr. Jeganathan spoke on the growth of InGaN nanowires by catalyst-assisted chemical vapour deposition technique with high aspect ratio for solar-driven water splitting applications. The band gap of the InGaN nanowires can be tuned to absorb a wide range of visible parts of electromagnetic spectrum by optimizing the composition of In:Ga, he said. He also presented the manifold morphologies of GaN nanowires (NWs) fabricated using halide chemical vapour deposition (HCVD) on an n-Si (111) substrate, which are promising photoelectrodes for photo-electrochemical (PEC) water splitting applications. Prof. Jeganathan further compared the substantial enhancement in the photocurrent for vertically-grown GaN NWs on a buffer layer with their counterparts such as GaN whiskers, tapered nanostructures and thin films.

On January 12, 2023, **Dr. S. Vignesh**, Alumnus of CECRI's B.Tech. Programme and Assistant Professor, Department of Chemistry & Biochemistry, University of Mississippi, USA gave a lecture on **Single-entity Electrochemistry**. He talked on the imaging of electrochemical reactions and biological phenomena at the nanoscale and single entity level to gain insights on (a) heterogeneity in the system and (b) enhanced mechanistic insights which are not possible with conventional techniques. His lecture included ideas to use and develop high-throughput multimodal imaging techniques such as optical, electrochemical and electron imaging to understand electrochemical and biological phenomena at the single entity level for rational design of better performing catalytic and biological systems at the ensemble level.



Snapshots



74th Republic Day Celebration



Technology Transfer to M/s. Balaji Construction, Raipur



Meeting with M/s. Indus Towers



Distribution of Cash Award for Excellence in Sports



Popularization of Science Event on *Food Adulteration*



Workshop on *Solar Energy Materials*



Distribution of *DIY Electrolysis Kit* to Sri Sankara Vidyalaya, Karur



Workshop on *Surface Engineering*

- ❖ 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

www.cecni.res.in

https://www.twitter.com/CSIR_CECRI



<https://www.facebook.com/ICSIR.CECRI>

<https://www.youtube.com/CSIR-CECRI-KKDI>