May 2023
Vol. 4 Iss. 5

CECRI NEWS

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

National Technology Day Celebrations

The **National Technology Day** was celebrated at **CSIR-Central Electrochemical Research Institute (CSIR-CECRI)**, Karaikudi on May 19, 2023 with enormous energy and enthusiasm. **Dr. Shankar Venugopal**, Vice-President, Mahindra & Mahindra, Mahindra Research Valley, Chennai graced the occasion as the Chief Guest and delivered the **National Technology Day-2023 Lecture** on ***Electric Mobility Ecosystem - how sustainability, supply chain and technology convergence are shaping the future of mobility?***". The programme commenced with a Welcome Address by Dr. V. Saraswathy, Chief Scientist, CSIR-CECRI and Head, Corrosion & Materials Protection Division who outlined the background of National Technology Day, being celebrated every year on May 11 since 1999, on different themes mainly to commemorate India's three major significant technological achievements which occurred on May 11, 1998:

"

The Tinker-preneurs of India will soon become leading Entrepreneurs of the World.

- Shri. Narendra Modi
Hon'ble Prime Minister of India
on National Technology Day 2023

"

INSIDE THIS ISSUE

(i) Successful conduct of nuclear tests in Pokhran (*code-named Operation Shakti*), thanks to the enormous efforts of Dr. APJ Abdul Kalam & others, **(ii)** Successful demonstration of test flight of HANSA-3 multi-purpose aircraft developed by CSIR-National Aerospace Laboratories (CSIR-NAL) and **(iii)** Successful test firing of Trishul-the quick reaction, short range surface-to-air missile of Defence Research and Development Organisation (DRDO) under India's Integrated Guided Missile Development Program. The then Hon'ble Prime Minister of India, **Shri. Atal Bihari Vajpayee** was so delighted with these developments that he instantly coined ***Jai Vigyan***, to add to the existing popular slogan - ***Jai Kisan, Jai Jawan***, she added.

She also elaborated on the **Theme for this year's National Technology Day - *School to Startups- Igniting Young Minds to Innovate***. The programs and celebrations for the 2023 National Technology Day will have a special focus on the **Atal Innovation Mission,** *a government initiative to promote a culture of innovation and entrepreneurship across the length and breadth of our country*, she delineated. She also mentioned our Hon'ble Prime Minister's Motivational Quote during the National Inauguration of this year's celebrations - *The Tinker-preneurs of India will soon become leading Entrepreneurs of the World*.

In his Presidential Address, **Dr. K. Ramesha, Director, CSIR-CECRI** began his speech by mentioning that National Technology Day serves as an opportunity to remember the work of the great scientists and engineers who have steered the country and this world towards technological advancement. This day honors the achievements of everyone working in the sphere of science and technology, he said.

He further described the contribution and achievements of CSIR-CECRI towards educating young minds and inculcating students with capacity building through its **B.Tech.** Programme, **Skill Development Training & Refresher Courses**, and **Jigyasa** activities with high-class R&D facilities for more than 75 years now. He emphasized CECRI's ongoing research and development activities and the need to re-orient its research priorities in the areas such as hydrogen, carbon capture, energy & fuels, e-mobility, and so on, in alignment with our national needs and goals.

The Chief Guest, **Dr. Venugopal**, in his lecture, spoke about the future of mobility and the key challenges faced today on e-mobility and its sustainable future. Even though the energy efficiency of electric vehicles is higher than IC engines, its further challenges are to reduce initial cost, enhance range anxiety and reduce the time of charging, he added. He also cited the **6D** framework on disruption and exponential growth defined by Dr. **Peter H Diamandis**, an international pioneer in the fields of innovation, incentive competitions, commercial space, in his talk.

Further, he discussed upon various areas such as deep-sea mining, urban mining, blue carbon - our Hon'ble **PM's Vision-SAGAR blue revolution**, asteroid mining and the space economy. He also talked about the predictions on convergence of industries – automobiles, infrastructure and energy in the near future and projected possible scenarios beyond the year 2040. He emphasized the importance of reducing carbon footprint and pursuing digital technologies in order to ensure a sustainable future for e-mobility.

The audience comprising of Scientists, Engineers, Research Scholars, B.Tech. Students, Staff Members, etc. gained valuable insights from this interesting and informative talk and the event concluded with a vote of thanks by Dr Jonas Davidson, Senior Principal Scientist and Head, TTBD, CSIR-CECRI.

Swachhata Pakhwada

In sequel to its continued cleanliness activities under the Swachh Bharat Mission, a flagship programme of the Government of India launched on October 2, 2014 by our Hon'ble Prime Minister of India which envisions a cleaner, safer, healthier and prosperous future for its citizens, CSIR-CECRI, Karaikudi observed Swachhata Pakhwada for the year 2023 (01st – 15th May 2023).

The activities proposed during this initiative is given below along with the highlights of the activities carried out:

SN	Date	Details of Activity
1	May 1, 2023	Administration of Swachhata Pledge
2	May 8, 2023	Fumigation of entire Campus
3	May 1-15, 2023	Cleanliness Drive
4	May 1-15, 2023	Waste Management
5	May 1-15, 2023	Disposal of Obsolete Items
6	May 1-15, 2023	Disposal of Scrap
7	May 1-15, 2023	Weeding out of Old Records
8	May 1-15, 2023	Publicity of Swachhata Activities
9	May 1-15, 2023	Restoration of Eco Park in Western Colony

Highlights:

- An advisory note was issued to the CSIR-CECRI, fraternity calling for their efforts in observing Swachhata Pakhwada for the year 2023.
- Banners were displayed in appropriate places at the Institute to create awareness about the event.
- Director, CSIR-CECRI administered Swachhata Pledge to all the employees of the Institute on May 1, 2023.
- Five acres of unused land in various locations of the campus containing wild vegetations were identified and was made to be suitable for plantation drive in which 400 saplings consisting of coconut and fruit bearing trees such as pomegranate, guava, fig, etc. were planted.
- Thorny bushes and weeds were cleared off in the Institute premises.
- A special cleaning drive, in addition to existing cleaning activities, was taken up to clean the campus and staff quarters areas.
- Fumigation with insecticides was carried out on May 12, 2023 in the campus especially to prevent the breeding of mosquitoes causing seasonal illness.
- Obsolete items such as iron scrap, damaged iron and wooden furniture were disposed off (*for a total value of Rs.73,51,439/-*) through Open Tender.
- A Shramdhan event was organized to clean the institute premises on May 13, 2023 (Saturday) in which a large number of staff members, research scholars, project staff and B.Tech. students took part enthusiastically.
- Old official records that have crossed the retention period have been identified and action is being taken for weeding out in a phased manner.

Business Development Leads

- Meeting on Green Hydrogen with Sterling Generators [May 9]
- Meeting with Gujarat Fluorochemicals Ltd. on Green Hydrogen [May 16]
- Meeting with Engineers India Ltd., Chennai [May 16]
- Technical Discussion on Hexagonal Boron Nitride [May 17]
- Meeting with Battery Manufacturing Team from Reliance Corporation, Navi Mumbai [May 17]
- Discussion on Green Hydrogen with BHEL R&D Team, New Delhi [May 18, 19]
- Online Meeting on Battery Test Lab (PTB Project) [May 23]
- Discussion on Project Proposals related to *Upscale Molten Salt Electrowinning of Rare Earths* with TMD, CSIR HQ [May 24]

Knowhow Transferred

- **i) *3D Printable Filament Fabrication by Melt Extrusion and***
- **ii) *Graphene coated Polymer Material***

to **M/s. Monotech Systems Ltd., Chennai** for Rs. 4.25 lakhs & Rs.12.75 lakhs, respectively for 5 years wef 04/05/2023.

CFE and AcSIR Highlights

Centre for Education:

- B.Tech. Project Review Meeting [May 3]
- Placement Drive for B.Tech. students [May 9]
- Viva Examination on Projects for B.Tech. students [May 17]

AcSIR:

- AcSIR PhD Comprehensive Examination [May 1, 4, 8]
- Extension of CSIR-SRF [May 3]
- Doctoral Advisory Committee Meeting [May 8]
- Synopsis Submission of Mr. Lawal Usman, CSIR TWAS Fellow (Guide: Dr. V. Ravi Babu) [May 12]
- PhD Viva-Voce Examination for Ms. G. Thamarai Selvi, AcSIR Scholar (Guide: Dr. Shailendra Kumar Jha, CSIR-NML & Co-Guide: Dr. B. Subramanian) [May 17]
- Meeting of Scrutinizing Committee for PhD admission AcSIR PhD & IDDP Admission - August 2023 Session [May 19]
- Selection Committee Meeting for AcSIR PhD & IDDP Admission - August 2023 Session [May 22]

Official Events

- Meeting of the Patent Evaluation Committee [May 8]
- Meeting of the Price Fixing Committee for 3D Metal Printing Jobs [May 8]
- Meeting of One Week One Lab Program Committee [May 10]
- First Equipment Prioritization Committee Meeting for the FY 2023-24 [May 10]
- Monitoring Committee Meeting to review the progress of on-going CPWD Works at CSIR-CECRI Campus, Karaikudi [May 17]
- Industrial Visit of Team from N.A. Manjammal Polytechnic College, Rajapalayam [May 25]
- Pre-Bid Meeting for Rate Contract of Medicines [May 30]
- Project Proposals Review/Recommendation Committee Meeting [May 31]
- Farewell and Felicitation Function for the Retirees [May 31]

Skill Development Activities

Skill Development Training Programmes:

- A Skill Development Training Programme on ***Lead-Acid Battery: Care and Maintenance*** was organized by CSIR-CECRI during May 08-12, 2023. A total of 54 participants took part in this programme.
- A Industry-oriented Refresher Course on ***Lithium-ion battery: Materials to manufacturing*** was organized by CSIR-CECRI during May 15-19, 2023. A total of 10 participants (6 from Renault Nissan Technologies Pvt. Ltd., Chennai, 1 from Gunal Daga Chemicals Pvt. Ltd., Pune, 1 from Academia and 2 Self-sponsored) attended this training programme.

CSIR-JIGYASA:

- **Vigyana Vindhai Programme**: The following talks were delivered during May 2023 in the Alagappa University Community Radio:
  - i) Dr. S.M. Rajendran, Sr. Principal Scientist on *Intellectual Property Rights* [May 9]
  - ii) Dr. M. Pandiaraj, Sr. Scientist on *The Story of Glucose Sensors: 50 Years of Transformation* [May 11]
  - iii) Ms. A. Varsha, Project Associate on *Black Hole* [May 15]
- **Online Quiz Contest** was organized through our Website on the following National/International Days of Importance during May 2023 :
  - i) International Year of Millets 2023
  - ii) National Technology Day [May 11]
  - iii) International Day of Light [May 16]
  - iv) World Telecommunication and Information Society Day [May 17]
  - v) International Museum Day [May 18]
  - vi) World Bee Day [May 20]
  - vii) International Biodiversity Day [May 22]
- CSIR-CECRI participated in the 8th Edition of **SUBCON 2023** [*An event to connect suppliers and buyers*] organized at **CODISSIA Trade Fair Complex, Coimbatore** by The Coimbatore District Small Industries Association (CODISSIA) during May 10-12 2023 and showcased its successful technologies:
  - Redox Flow Battery (Dr. P. Ragupathy)
  - Supercapacitor (Dr. M. Sathish)
  - Extraction of Metal Values from Waste (Dr. M. Jayakumar)
  - Zinc-Nickel Electrodeposition on Stainless Steel (Dr. C. Jeyabharathi)
  - Electrosynthesis of p-aminophenol (Dr. M. Kathiresan)

- **Visit of Students**:
  - i) 75 Students and 3 Faculty Members from **NIT, Trichy** [May 16] visited CSIR-CECRI, Karaikudi and gained valuable insights on the ongoing R&D activities.
  - ii) 279 students and 14 faculty members from various colleges visited our Institute under the **Naan Mudhalvan Scheme** [May 15, 17, 19]. They were briefed on the genesis and vision and mission of CSIR-CECRI. The participants went around the Institute and had a glimpse of the R&D activities being carried out in various divisions.

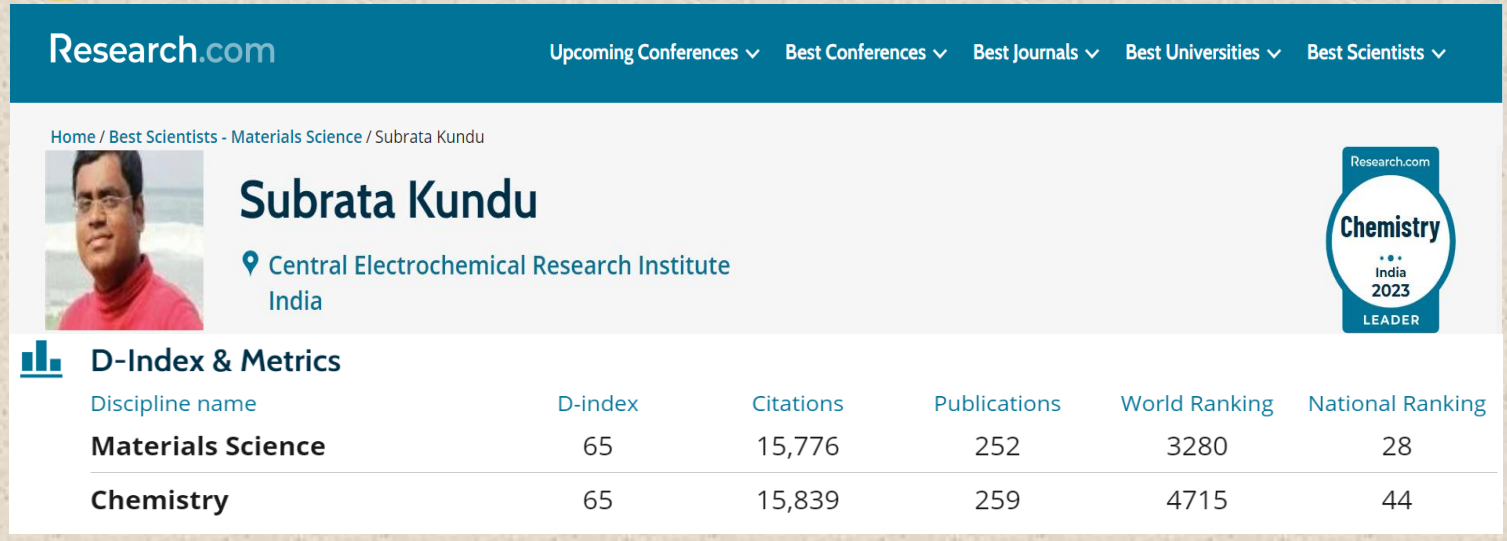
Deputation Abroad

Dr. Subrata Kundu, Principal Scientist was deputed to London for attending the Editorial Board Meeting of Royal Society of Chemistry on May 19, 2023 at Burlington House, London, United Kingdom.

Dr. A.S. Prakash, Sr. Principal Scientist was deputed to Bangladesh for participating in CSIR-BCSIR Joint Symposium on *Advanced Functional and Smart Materials for Sustainable Development* at Dhaka during May 30-31, 2023.

Honours and Awards

- **Dr. Subrata Kundu**, Principal Scientist, CSIR-CECRI, Karaikudi has been recognized among **Best Scientists** [National Ranking: **28th Position (*Materials Science*) & 44th Position (*Chemistry*)**] by **Research.com** recently in its **2nd Edition of Ranking of the Best Researchers** [*based on data derived from multiple data sources including OpenAlex and CrossRef as on December 21, 2022 and the Ranking is based on a Researcher's D-index (Discipline H-index), which only includes publications and citation values for an examined discipline*].



Best Poster Presentation Awards in the 7th International Conference on Nanoscience & Nanotechnology (ICONN-2023) held at SRM University, Chennai during March 27-29, 2023:

- **Ms. A. Soundarya Mary**, DST-INSPIRE-SRF & AcSIR Scholar (Guide: Dr. A. Pandikumar) for the work *Enhanced water oxidation kinetics of $BiVO_4$ photoanode with Mn-NiOOH oxygen evolution catalyst*

- **Ms. Ardra S Darsan**, DST-INSPIRE-JRF & AcSIR Scholar (Guide: Dr. P. Murugan) for the work *Fabrication of hematite thin films via pulsed laser deposition for efficient photoelectrocatalytic water splitting*

Selection to All India CSIR Team:

- **Mr. M. Pradeeban**, Technician (1), CSIR-CECRI has been selected to the **CSIR National Cricket Team** [2023-26] based on his exemplary performance during 51st SSBMT Zonal. He will represent CSIR in the Inter-Ministerial Cricket Tournaments.

New Member in CSIR-CECRI Family:

- **Ms. B. Nithya**
  Technical Assistant
  (*Chemistry*)
  Corrosion & Materials Protection Division
  Date of Joining: 22/05/2023

Recent Research Publications

- Recent advancement of 2D bi-metallic hydroxides with various strategical modification for the sustainable hydrogen production through water electrolysis
  N. Sreenivasan, N.D. Hariharan, Arun Karmakar, and Subrata Kundu
  ES Materials and Manufacturing 19 (2023) 830; https://dx.doi.org/10.30919/esmm5f830
- Magnetic frustration driven by conduction carrier blocking in $Nd_2Co_{0.85}Si_{2.88}$
  M. Kundu, Santanu Pakhira, Renu Choudhary, Shuvankar Gupta, Sudip Chakraborty, N. Lakshminarasimhan, R. Ranganathan, Duane D. Johnson and Chandan Mazumdar
  Physical Review B 107 (2023) 094421; https://doi.org/10.1103/PhysRevB.107.094421
- Boosting the activity of the oxygen evolution reaction through an electrospun nickel manganese-based bimetallic zeolite imidazolate framework fibrous system in alkaline medium
  S. Sam Sankar, M. Swathi, R. R. Mohamed, Amal BaQais, M.A. Amin and Subrata Kundu
  Inorganic Chemistry 62 (2023) 6411; https://doi.org/10.1021/acs.inorgchem.3c00349
- Redox-active and urea-engineered-entangled MOFs for high-efficiency water oxidation and elevated temperature advanced CO_2 separation cum organic-site-driven mild-condition cycloaddition
  Manpreet Singh, Arun Karmakar, Nilanjan Seal, Partha Pratim Mondal, Subrata Kundu and Subhadip Neogi
  ACS Applied Materials & Interfaces 15 (2023) 24504; https://doi.org/10.1021/acsami.3c03619

Snapshots

Administration of Anti-Terrorism Day Pledge

Inauguration of SDTP on *Lead-Acid Battery: Care and Maintenance*

Visit of Students to CSIR-CECRI, Karaikudi

Swachhata Pakhwada Activities

CSIR-CECRI Tennis Team at CSIR TMLT Tournament-2023, Trivandrum

Farewell and Felicitation 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

www.cecri.res.in

https://www.twitter.com/CSIR_CECRI

https://www.facebook.com/1CSIR.CECRI

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

Published by: PPMG Section, CSIR-CECRI, Karaikudi – 630003 (Tel: 04565-241204; Email: medianodal@cecri.res.in)