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CSIR MADRAS COMPLEX

Council of Scientific & Industrial Research
Taramani, Chennai - 600113.

CSIR FOUNDATION DAY

The CSIR foundation day, was celebrated with great enthusiasm, at the CSIR Campus in Taramani, Chennai by CSIR-Structural Engineering Research Centre (CSIR-SERC) and CSIR Madras Complex (CMC).

Open Day was observed on 26 September 2023, at CSIR Campus, Taramani, Chennai, by CSIR-Structural Engineering Research Centre (CSIR-SERC) and CSIR Madras Complex comprising the regional units of CSIR-CECRI, CSIR-CEERI, CSIR-CSIO, CSIR-NEERI and CSIR-NML.

All laboratories in the CSIR Campus were kept open for the general public between 9.30 am and 4 pm. Elaborate arrangements were made to receive the visitors. Technologies, products and state-of-the-art facilities were showcased and demonstrated for the benefit of the visitors. Around 8000 visitors including school and college students, teachers, professionals from the industry, entrepreneurs and general public visited the campus with great enthusiasm. They had first-hand glimpse of multifarious and multi-discipline R&D programmes currently going on in the laboratories and the technologies developed. The visitors showed keen interest and passionately interacted with the scientific staff.

The foundation day function was held on 3rd October 2023 along with the Birth Centenary Celebrations of Prof G.S. Ramaswamy, former Director CSIR-SERC. The programme was presided over by Dr. N. Anandavalli, Director, CSIR-SERC and Coordinating Director, CMC. Shri Ashwin B. Pandya, Secretary General, ICID & Ex CWC Chairman, International Commission on Irrigation & Drainage, New Delhi was the chief guest of the function who delivered the Foundation Day Lecture. Dr. P. Srinivasulu, Former Director Grade Scientist, CSIR-SERC and Dr. C.V. Vaidyanathan Former Director Grade Scientist, CSIR-SERC, delivered the Prof. G.S. Ramaswamy Birth Centenary Lecture.

As a part of the function, Director, CSIR-SERC and Coordinating Director, CMC, honoured the employees of CSIR-SERC and CMC, who have superannuated during the past one year. The employees who have completed 25 years of service in CSIR were also felicitated. Cash and studentship awards were also presented to the wards of the employees of CSIR-SERC and CMC for their meritorious educational and sports achievements.

Every year, as a part of CSIR foundation day celebrations, an inter-school quiz programme, Eureka, and CSIR open day science competitions for the wards of employees of CSIR-SERC and CMC are organized. This year, Eureka 2023 was organized on 22 September 2023 at the CSIR Campus. Around Forty schools from in and around Chennai participated in the event. CSIR open day science competition was held on 3 September 2023 at the CSIR campus and more than 100 students participated. Prizes were distributed for the winners of the competitions on 3rd October 2023, during the foundation day function by Dr. N. Anandavalli, Director.



HINDI FORTNIGHT CELEBRATION

Hindi Fortnight was celebrated in the campus, jointly by CSIR Madras Complex and CSIR-SERC during 31.08.2023 to 21.09.2022. Various Competitions in Hindi was conducted during the week.



As part of the Hindi Fortnight Celebrations, a Scientific and Technical Seminar was organized on 31st Sep 2023 with the theme “ Science and Technology in India @ 2047”

Around 15 Scientists from CSIR-SERC, CSIR-CMC and CSIR-CLRI presented their R&D work related to the theme. A “Kavi Sammelan” was also organized on 12 Sep 2023 as part of this celebrations



The valedictory function was held on 20 Sep 2023 at CMC Conference Hall. Dr. K.J.Sreeram, Director CSIR-CLRI was the Chief Guest and delivered the Hindi Fortnight Lecture. Dr. N. Anandavalli, Director, CSIR-SERC and Co-ordinating Director, CMC presided over the function and distributed prizes to the winners of the competitions etc. Smt. Vani Satyanarayana, Hindi Officer presented the report of Hindi Implementation.



VIGILANCE AWARENESS WEEK

Vigilance Awareness Week was observed in the campus from 30th October 2023 to 6th November 2023. The event began with the Pledge taking, workshop, lecture, invited talk, debate competitions among staff members. The valedictory function was organized on 6.11.2023. Dr. N. Anandavalli, Director, CSIR-SERC and Coordinating Director, CMC presided over the function and Shri Senthil Avoodai Krishna Raj S, IPS, Deputy Inspector General, Uttarakhand was the Chief Guest and delivered the Valedictory address. The program was held at Vigyan Auditorium. Prizes were also distributed to the winners of various competitions.



Gandhi Jayanthi as SHRAMDHAN DAY

Gandhi Jayanthi on 2nd Oct 2023 was observed as “SHRAMDHAN DAY” in the campus. Cleanliness drive and Swachhata Shapath (Pledge) was taken by all present.



Gandhi Jayanthi



Swachhata pledge being administered
Coordinating Director



Cleanliness Drive



Cleanliness Drive



Professor A. K Shukla, Honorary Professor, IISc, Bangalore, and Shri R. Venkatadri, Chief Commercial Officer, Tata Chemicals, inaugurating the exhibition during the energy technology meet

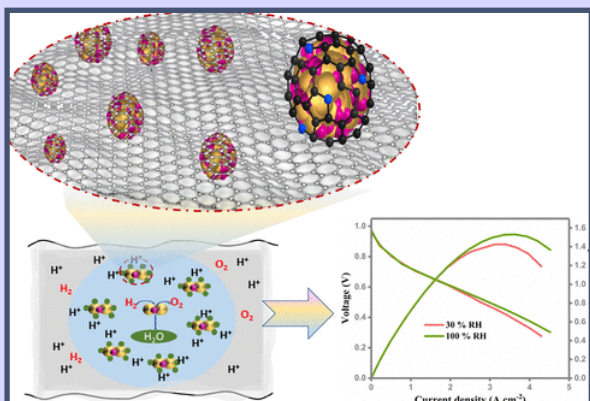


Coordinating Director Dr. N. Anandavalli welcoming Mr. David Eggleston, Deputy Consul General for South India, Australian Government.

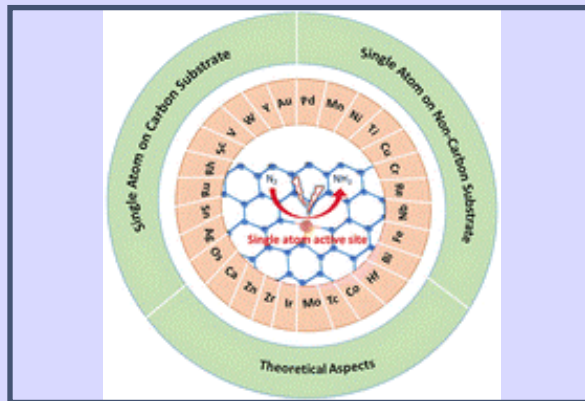
- Energy technology meet at CECRI Chennai Unit was held on July 27th, 2023 as a part of one week one lab (OWOL) program of CSIR-CECRI. More than 40 delegates from industries participated in the event.
- A meeting of scientists from CSIR with the members of the Australian Hydrogen Research Mission to India was organized at the CECRI Chennai Unit on November 21, 2023. The delegates from various Australian universities met scientists from CECRI at its Chennai Unit and engaged in fruitful discussions followed by technical presentations. Future collaborations in the areas of the production of green hydrogen, its storage, and its utilization were discussed by both sides.
- International conference on green hydrogen 2023 was held from July 5–7, 2023. Scientists from CECRI Chennai Unit participated in the conference and demonstrated fuel cell technology at the event.
- Scientists from CSIR-CECRI scientists participated and demonstrated CECRI's fuel cell technology and fuel cell model during the 14th Clean Energy Ministerial and 8th Mission Innovation Meeting, India-2023, at Goa University, Goa, India, from July 19–22, 2023.

Research and Development Efforts

Solvent-Free, One-Pot Synthesis of Tungsten Semi-Carbide for Stable and Self-Hydrating Short-Side-Chain-Based Polymer Electrolyte Membrane for Low-Humidity Hydrogen Fuel Cells: Polymer electrolyte membranes (PEMs) that promote fast and selective ionic transport at low relative humidity (RH) are of high demand for energy conversion devices, particularly in hydrogen fuel cells. Herein, we report a facile and solvent free synthesis of tungsten semi-carbide (W₂C@NC) and its incorporation onto short side chain (SSC)-based membrane matrix to facilitate water holding and water-assisted humidification generated by the reaction of crossover gas molecules. In the present study, the influence of W₂C@NC on the membrane matrix is widely investigated through its microstructure, physicochemical properties, proton conductivity, and fuel cell performance. It is demonstrated that addition of W₂C@NC facilitates membrane hydration via in situ water generation, thus preventing fuel crossover across the membrane. In addition, W₂C@NC contributes toward low-humidity polymer electrolyte fuel cell (PEFC) operation. The study revealed minimal differences in cell performance between fully humidified and low RH conditions for composite membranes, with a noteworthy improvement in performance observed even under completely dry conditions compared to pristine membranes. Apart from good thermal and mechanical stabilities, 81% of initial OCV and 72.86% of current density was retained even after 100 h of accelerated stress test (AST), which opens further perspectives for development of perfluoro sulfonic acid (PFSA) based low RH proton exchange membrane fuel cells (PEMFCs).

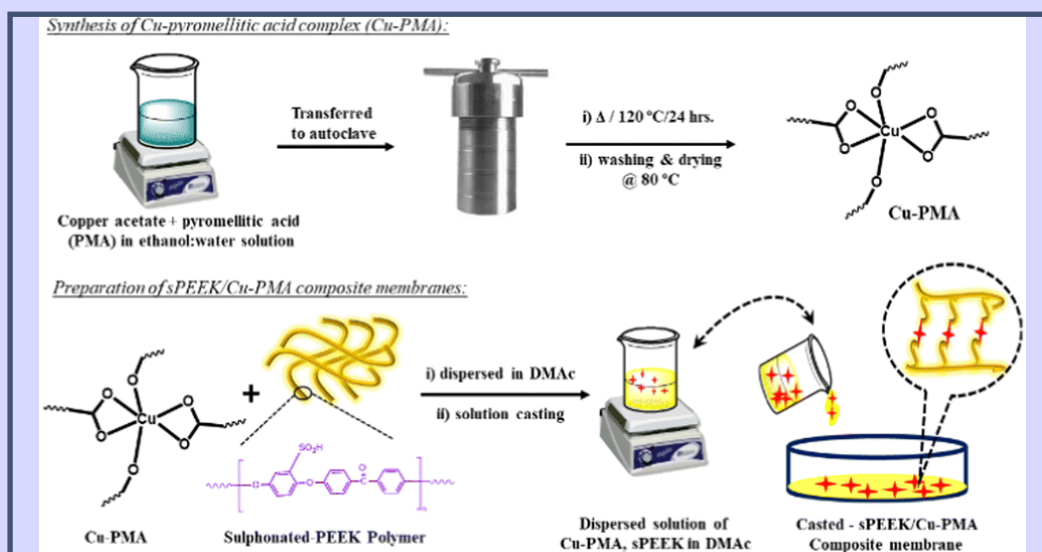


Interaction of tungsten semi-carbide with short side chain polymer matrix with fuel cell polarization.



Various single metal atom catalysts studied in recent times for nitrogen fixation

- Electrochemical nitrogen fixation on single metal atom catalysts: A review article on Electrochemical nitrogen fixation on single metal atom catalysts was published in ChemComm. The review article provides an overview of recent developments of single metal atom based electrocatalysts dispersed on various support materials for electrocatalytic nitrogen reduction reactions.
- Special tailoring of a copper–pyromellitic acid complex with sulfonated poly(ether ether ketone) was carried out to form a composite membrane for polymer electrolyte fuel cells: Composite membranes comprising a copper–pyromellitic acid complex (Cu–PMA) and sulfonated poly(ether ether ketone) (sPEEK) were tailored specifically for their superior PEFC performance. A comprehensive study of the optimal concentration of Cu–PMA in the sPEEK matrix revealed that a 0.5 wt% concentration of Cu–PMA showcases a significant impact on the intrinsic properties of sPEEK, by modulating the hydrophilic/hydrophobic phases, and creating a water channel network for improved proton conduction in the composite membrane. The resulting sPEEK/Cu–PMA-0.5 wt% composite membrane exhibited an exceptional proton conductivity of 0.162 S cm^{−1}, an ion exchange capacity of 1.71 meq g^{−1}, a water uptake of 23.97 ± 0.016%, and a lower activation energy of 27.44 kJ mol^{−1}, surpassing all other as-prepared sPEEK/Cu–PMA composite and sPEEK membranes.



Synthesis of the Cu–PMA complex and sPEEK/Cu–PMA composite membranes.

Awards and recognitions

1. Award for the best ECF earning scientist in CECRI was presented to Dr. Vishal M Dhavale on CSIR Foundation day, September 26th, 2023.
2. Award for the best ECF earning division in CECRI was presented to CECRI Chennai Unit on CSIR Foundation day, September 26th, 2023.
3. Award for the best technology transfer in CECRI was presented for demonstration and validation of a LT-PEMFC system for automotive application and was received by CECRI Chennai Unit team on September 26th, 2023.
4. Dr. Santoshkumar D Bhat, Senior Principal Scientist, CECRI Chennai Unit, was selected for the prestigious CSIR-Raman Research Fellowship for the year 2023-24.

Academic visits and talks

1. Dr A K Sahu delivered an invited lecture on “Self-Humidifying Membranes for Polymer Electrolyte Fuel Cells” during the International Conference on “Membrane based Separations: Past, Present & Future (MSPPF 2023)” organized in association with the Maharaja Sayajirao University, Baroda, and CSIR-Central Salt & Marine Chemicals Research Institute, Bhavnagar, from October 16 – 18, 2023, Vadodara, Gujarat.
2. Dr A K Sahu delivered an invited lecture on “PEM Fuel Cells for Stationery and Automotive Power Generation” in the International Meeting on “Energy Storage Devices (IMESD 2023)” and Industry-Academia Conclave at Indian Institute of Technology, Roorkee, from December 7–10, 2023.
3. Dr. A S Prakash, delivered an invited lecture at the Indian Conference on Carbon Materials (ICCM-23) held from November 30 to December 2, 2023, at DAE Convention Centre, Anushaktinagar, Mumbai. His contribution added significant value to the conference, enhancing our institute’s presence on the national stage.
4. Visit of Prof. Dr. Atef Youssef Shenouda under CV Raman Fellowship (October 30 – December 8, 2023): CECRI had the honor of hosting Prof. Dr. Atef Youssef Shenouda, a senior researcher from Egypt, under the prestigious CV Raman Fellowship. Dr. Shenouda’s visit, was aimed at fostering international collaboration, and aligns with our commitment to advancing scientific knowledge. We extend our gratitude for his valuable contributions during his stay.
5. Dr. Sathiya Mariyappan a researcher at CNRS, College du France, Paris, visited and delivered a lecture entitled, “The hard path on the success of Na₃V₂(PO₄)₂F₃- hard carbon Na-ion cells: What next?” Dr. Mariyappan, shared valuable insights with our academic community.
6. Career Progression Programme at Vikram Sarabhai Space Center, ISRO: Dr A S Prakash, played a significant role in advancing the career progression of scientists, engineers, and technical assistants, at VSSC, ISRO from November 30 – December 1, 2023. Dr Prakash, had contributed by giving training through lectures during the two-day event on “Basics of Electrochemical Systems.”
7. Dr A S Prakash actively participated in the International Workshop on Advanced Materials Challenges and Standardization need for Net Zero Technologies (AMCSNZT-2023) held on October 9, 2023, and delivered an invited lecture on “Powering the Future: A Comprehensive Update on the Development Status of CSIR Battery Technologies”.
8. Science Summit at the United Nations General Assembly: Dr A S Prakash had a privilege of delivering a technical lecture on “Powering the Future: A Comprehensive Update on the Development Status of CSIR Battery Technologies”. He proudly represented CSIR at the Science Summit organized by the United Nations General Assembly, which was conducted in online mode during 22 and 28, 2023 under the energy theme.

R & D news

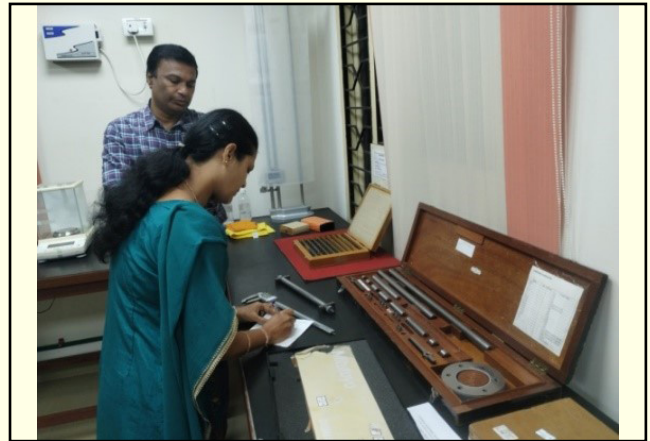
Third Monitoring Committee (MC) meeting was held at CEERI Chennai Centre during 20-21st of November 2023. This meeting was chaired by the Director, CSIR-NCL along with the other MC members who attended in person as well in virtual mode. The Scientists from CSIR-IIP, CSIR-NCL, CSIR-IICT and CSIR-URDIP were participated in the meeting and presented their progress during the meeting. The Principal Investigator from CSIR-CEERI Chennai centre demonstrated the developed conveying systems for identification and sorting of Polymer types like PP and PE to the members of MC meet as well to the CSIR monitoring committee members

Name of the author(s)	Title of the Topic	Venue	Date
Rupesh Kumar, A Mercy Latha, Vishant Gahlaut, Meenu Kaushik	Analysis of Terahertz FMCW Radar System for 2D SAR Imaging	MAPCON 2023, Ahmedabad	Dec 11 -14, 2023
Vishant Gahlaut, A Mercy Latha, Amita- vo Roy Choudhary, Meenu Kaushik, Vis- hant Gahlaut	Electrical and Thermal Design of ka-band Du- al-Anode Electron Gun with PPM Focusing for Space Applications	MAPCON 2023, Ahmedabad	Dec 11 -14, 2023

Honours/Awards

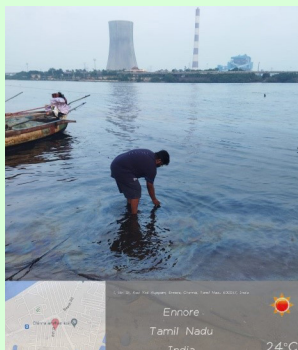
- Dr. A. Mercy Latha received CSIR Young Scientist Award in Engineering Sciences for the year 2022 for her outstanding contributions in the areas of high-power microwave devices and THz systems leading to applications in space technology

1. A Grid Anti-islanding tests for solar Micronvertors as per IEC 6216 standard under CRTDH was conducted successfully and test report issued to M/s. Kripya Technologies India Pvt. Limited, Chennai
2. The onsite surveillance assessment by NABL for calibration laboratory of the Centre was held between 27th and 28th August 2023. The first day of NABL assessment started the verification of all physical documents and their authenticity, parallel to the verification of Standard Operating Procedures for the master equipment. On the second day, assessment of calculation parts of claimed CMC of Master equipment under NABL scope.
3. The patent on “MAGNETO NANOTECHNOLOGY DENGUE DETECTION DEVICE AND METHOD THEREOF” is granted on 4th December 2023. CSIR-CSIO, Chennai Centre has jointly investigated this work with Sri Ramachandra University, Chennai.



On-going R&D Activities

CSIR-NEERI, Chennai Center performed a study on effect of marine species post oil spill at Ennore in December 2023. Crustation samples collected in field and its comparison pre and post oil spill indicated a variable difference and decline. Current studies are underway to understand the effect of oil spill on crustacean species.



A study on the impact of pesticide application methods, specifically comparing drone-based and conventional approaches, on microbial diversity within agricultural fields has been initiated by CSIR-NEERI, Chennai Center. As an initial approach, metagenomic analyses of soil samples from Palani, Dindigul and Thiruvananthapuram in Tamil Nadu, were studied for microbial communities. The outcome of the datasets would be explored further to study soil and air environment.

Towards solutions for industrial activities, CSIR-NEERI, Chennai Center has been approached by Manali Petrochemicals, Manali, Chennai for remedial measures for treatment of high TDS wastewater. In coordination with headquarters, CSIR-NEERI will be undertaking a project for providing technical guidance for management of high TDS in effluent water.

Notable contributions:

Centre of Excellence for Fireworks at Sivakasi, Tamilnadu: Foundation stone for RACE facility (Raw materials/ Chemicals Composition & Emissions Testing Facility) as Centre of Excellence (CoE) has been laid at Sivakasi. This CoE will cater to the needs of various fireworks manufactures in India. The correlation between composition and emissions of fireworks will be developed, which will be used to control the emissions of fireworks.

Participation in Hydrogen Mission: CZC, CSIR-NEERI is currently participating Hydrogen mission program, one of the national-level important activities in India. Low-cost electrodes with minimum Platinum loading are being developed under this project.

Water quality management: CZC, CSIR-NEERI is involving several NGT hearings (Kuzhikandam Thodu, Kerala, Sarkar Periyapalayam Lake, Tamilnadu, etc.) and providing recommendations about the water quality of various water bodies to the authorities.

Supporting of Industries: CZC, CSIR-NEERI is currently addressing the issues with the products/effluents of Industries. CZC, CSIR-NEERI is trying to address the issues with the products of TTK Healthcare Ltd.

Evaluation of Distance Criteria for Habitation and State and National Highways from Stone Crushing Industries located across the state of Tamil Nadu by comprehensive Air Pollution monitoring and modelling technique.

Assessment of Environmental Quality (Air, Noise, Water and Marine Environment) for the coastal zone of Chennai District.

NML Madras Centre's Contribution to Process & product/technology development from industry-sponsored R&D project:

- NML Madras Centre successfully demonstrated plant trials of coal flotation reagents, developed in collaboration with M/s Sudarshan Chemicals Industries Limited, Pune, at West Bokaro Coal washery of M/s Tata Steel Ltd. This pivotal demonstration was conducted to showcase the effectiveness of coal flotation reagents at a plant scale of 150 tonnes per hour flotation circuit capacity. The commercial-scale plant trials conducted using these coal collectors provided positive responses in terms of yield and ash levels, a stepping stone towards commercialization of the reagents.
- NML Madras Centre joined hands with heavy mineral beach sand washing plant of M/s Indian Rare Earths Limited (IREL), Manavalakurichi, to work collaboratively to develop tailored solutions to streamline operations, reduce surface contamination on heavy mineral beach sand, and improve overall process efficiency of 150 tonnes per day treatment capacity. These solutions encompassed the implementation of advanced technologies and fine-tuning of processing parameters, thereby addressing the identified challenges head-on, and for long-term sustainability, meeting both environmental and economic objectives.
- NML Madras Centre R&D recent initiative focused on the recovery of carbon/graphite from the black mass of used/spent batteries represents a significant effort towards sustainable and environmentally conscious practices in the management of electronic waste. This emerging field seeks innovative solutions to extract valuable carbon materials from spent batteries, addressing both resource conservation and pollution reduction.

New Projects initiated:

- Reduction of surface contamination of Teri heavy mineral sand and dewatering studies on slimes sponsored by M/s Indian Rare Earths Limited, Odisha.
- Flotation kinetics and feasibility studies of silica reduction from pre-concentrate of JSW BHQ ore processing pilot plant using froth flotation initiated under technology development thematic research area.
- Evaluation of performance of newly developed flotation reagents sponsored by M/s Sudarshan Chemicals Industries Limited, Pune.

Course attended & Talk delivered:

- Dr. Mousumi Gharai attended the 47th Induction Programme for the newly Recruited Scientists during 17-26 July 2023 at CSIR-HRDC, Ghaziabad.
- Dr Mousumi Gharai delivered a talk in Hindi on “Science and Technology in India @ 2047” during the Hindi fortnight celebration on 31.08.2023.

INFORMATION PERTAINING TO RECRUITMENT, PROMOTION, RETIREMENTS ETC. FOR THE PERIOD 01.07.2023 TO 31.12.2023 IN RESPECT OF COMMON SERVICES AND THE PARTICIPATING UNITS OF THIS COMPLEX IS AS BELOW :-

ADDITIONAL CHARGE :-

S.no	Name & Designation	Date of Joining	Unit
1.	Shri N. Suresh, Section Officer(S&P)	13.09.2023(FN)	CMC

PROMOTION/FINANCIAL UPGRADATIONS :-

S.no	Name & Designation	Pay	Date of Promotion/ MACP	Unit
1	Smt S. Jothilakshmi, ASO(F&A) ad-hoc	Pay Matrix Level – 7 Rs. 44900/-	24.08.2023	CMC
2	Smt V. Deepalakshmi, Sr. Stenographer(MACP)	Pay Matrix Level – 8 Rs.62200/-	17.01.2023	CMC

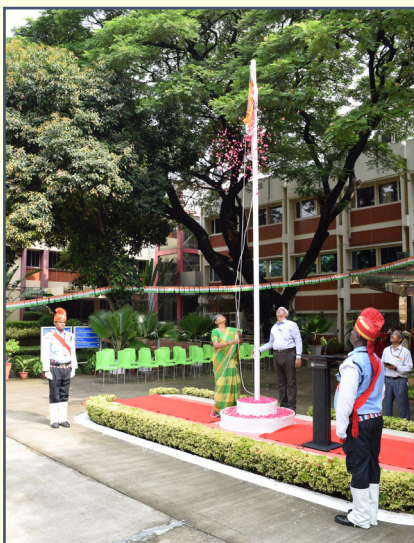
RETIREMENT/SUPERANNUATION/VRS :-

S.no	Name & Designation	Date of Superannuation	Unit
1.	Shri G. Gunasekaran, Sr. Technician(2)	11.08.2021	CSIR Madras Complex, Chennai

TRANSFERS

S.no	Name & Designation	From	To	DOJ/Date of reliving
1.	Shri N. Suresh Assistant Section Officer(S&P)	CSIR Madras Complex, Chennai	CSIR-SERC, Chennai	12.09.2023(AN)
2.	Shri C. Shyam Sunder, COA	CSIR-NEERI Zonal Centre, Hyderabad	CSIR Madras Complex, Chennai	09.10.2023(F/N)
3.	Shri Bhuneshwar Yadav, Security Assistant	CSIR-NEERI, Nagpur	CSIR-NEERI Chennai Unit, CMC	21.09.2023(FN)

Independence Day Celebrations



Dr. N. Anandavalli, Director CSIR-SERC and Coordinating Director, CMC, hoisting the National flag and addressing the gathering on the eve of Independence Day-2023