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दि लेदर पोस्ट
The Leather Post

सीएसआईआर–केन्द्रीय चर्म अनुसंधान संस्थान
CSIR-Central Leather Research Institute

International Training Workshop on "Emerging Trends in Materials"

Prof. S. S. Dutta Memorial Lecture

Director's Message

Greetings and Namaskar to the Stakeholders of the leather sector

Dr K J Sreeram
Director, CSIR-CLRI

चर्म उद्योग और अनुसंधान एवं विकास पर लिखने वाले जाने–माने कॉलम–लेखक माइक रेडवुड ने हाल ही में अपने एक कॉलम में एक वैज्ञानिक के बारे में लिखा, जिन्होंने उनके एक लेख का उत्तर इस टिप्पणी के साथ दिया, "विज्ञान को एक ताली और एक बधाई से अधिक धन की आवश्यकता है"। माइक रेडवुड के अनुसार अनुसंधान, अब बाजार–के–समान विकास, फर्म–विशिष्ट कौशल पर आधारित परिणाम और दीर्घकालिक विचारों में विभाजित है। फरवरी के अंक में, हम उपरोक्त श्रेणियों के अंतर्गत प्रमुख रूप से आनेवाले गतिविधियों पर प्रकाश डालते हैं। हम दीर्घकालिक विचारों जैसे कि कॉम्पैक्ट ग्लाइऑक्सल चर्मशोधन प्रणाली, बाजार–के–समान विकास जैसे रक्षा कर्मियों के लिए ठंड के मौसम में सुरक्षात्मक दस्ताने, और NAM देशों के लिए कार्यशालाओं के माध्यम से उद्योग में विशिष्ट कौशल विकसित करना आदि के बारे में व्यापक जानकारी देते हैं।

जब हम इन प्रयासों पर प्रकाश डालते हैं, तो हम उद्योगों को संस्थान के विकास के लिए अपने सीएसआर फंड में योगदान करने के लिए भी आमंत्रित करना चाहेंगे। कुछ कक्षाओं, अनुसंधान प्रयोगशालाओं और प्रसार केंद्रों के निर्माण की आवश्यकता है – अनुमानित लागत लगभग 50–60 करोड़ रुपये है। लाखों में छोटे योगदान से भी इस अभियान को बहुत लाभ होगा।

In a recent column Mike Redwood, a well-known columnist who writes on the leather industry and R&D, wrote about a scientist responding to an article of his with the comment, "Science needs funding more than a clap and a congratulation". Research, according to Mike Redwood, is now divided into close-to-market developments, developments based on firm-specific skills, and long-term ideas. In the February issue, we highlight the activities which prominently fall under the above categories. We detail long-term ideas such as compact glyoxal tanning systems, close-to-market developments such as cold weather protective gloves for defense personnel, and developing specific skills in the industry through workshops such as that for NAM countries.

While we highlight these efforts, we also would like to invite the industries to contribute their CSR funds for the institute's development. There is a need for constructing a few classrooms, research laboratories, and dissemination centers – estimated at around Rs. 50-60 Crores. Even small contributions in lakhs would tremendously benefit the cause.

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Nature-inspired Catalysis: For a Sustainable Hydrogen Future

As our world's energy needs continue to rise, and our traditional fuel sources become scarcer, the search for eco-friendly and sustainable alternatives becomes increasingly crucial. Hydrogen has high energy density and carbon-neutral properties which makes it as a promising alternative to fossil fuels. However, it has low volumetric energy density i. e, the amount of energy that can be contained within a given volume is low. This property of hydrogen poses challenges for its widespread use.

Solid chemical hydrogen storage materials are preferred over gaseous and liquid storage materials due to their high hydrogen density and stability. Ammonia borane (AB) is one such material which can store 19.6 wt.% of hydrogen at ambient conditions. When required, all three moles of hydrogen can be released from AB through solvolysis using a suitable catalyst.

Inspired by the metallo-hydrogenase enzyme found in nature, a robust and cost-effective Iron (Fe) hotspots containing Nickel (Ni) boride nanocatalyst was designed for ammonia borane dehydrogenation by the researchers of CSIR-CLRI. This catalyst efficiently releases three moles of hydrogen in less than a minute following enzyme-like kinetics. The 10%Fe-Ni-Ni3B catalyst exhibited the highest catalytic activity, with a remarkable hydrogen production rate and turnover frequency. The activation energy (Ea) calculation showed a significant decrease in the activation energy of 10%Fe-Ni-Ni3B compared to Ni-Ni3B.

The reaction kinetics with respect to substrate (AB) concentration is similar to the enzyme-like Michaelis-Menten kinetics. This is a rare phenomenon observed for a non-enzymatic reaction following enzyme-like kinetics at the surface of the heterogeneous catalyst.

The researchers investigated the mechanistic details of the catalyst for ammonia borane dehydrogenation. There is a strong electronic communications between B, Ni, and Fe, inducing remarkable cooperativity in boosting the 10%Fe-Ni-Ni3B catalyst rate for ammonia borane dehydrogenation. Research involving insightful learning from the nature and implementing its properties in heterogeneous catalysts to produce hydrogen from solid hydrogen carriers like ammonia borane, will help us to achieve a sustainable hydrogen economy.

Rajani Kumar Borah, Adarsh P. Fatrekar, Pratibha Bakre, Santosh G. Tilve, Amit A.Vernekar

Fe hotspots in the Ni–Ni3B nanocatalyst unravel remarkable cooperativity to boost hydrogen production from ammonia borane with enzyme-like catalysis

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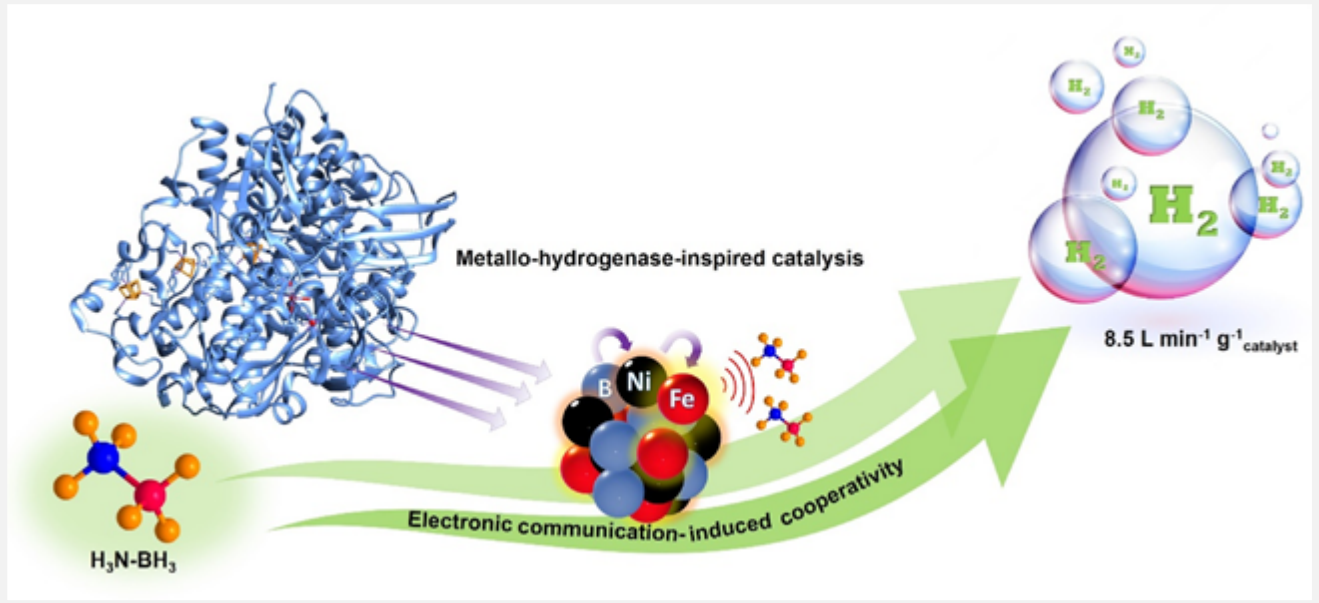

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LCT02

LIGNIN BASED RETANNING AGENT

Technology Outline

- Effluent from the paper and pulp industry predominantly contains large amounts of polyphenols like lignin and fragmented lignin.
- The leather industry consumes a huge amount of synthetic phenol-formaldehyde resin as a re-tanning agent to improve the homogeneity and organoleptic properties of leather.
- The presence of free formaldehyde in leather is a major concern because of its carcinogenicity. Hence, the development of a phenolic re-tanning agent devoid of formaldehyde is emerging.
- Waste liquor collected from the paper and pulp industry has been chemically modified and used as a re-tanning agent in leather manufacturing.

Lignin based Retanning Agent

Salient Features / Highlights / Advantages

- Utilization of paper and pulp industry waste as a re-tanning agent.
- Product is free from formaldehyde.
- Imparts excellent softy touch and wet feel to the leather.
- Smooth and fine grain.
- Compactable with all kind of syntans, vegetable tannins and fatliquors.

Commercialization Status / Techno - Economics:

- Status of commercialization : This technology is ready for commercialization
- Major Raw Materials to be utlilized: Black liquor and acid
- Validation level: Lab and Pilot scale trails were carried out
- Handholding support: Training, Demonstration, Technology Document, Trouble Shooting, Technology Implementation
- Techno-Economics :
  - Approximate payback period / ROI is 12 Months

PROTEIN-BASED SYNTHETIC TANNING AGENT

LCT03

Protein-based syntan from chrome shaving dust at pilot scale level

Technology Outline

- Safe and environmentalfriendly separation of collagen hydrolysate from chrome shaving waste by alkali treatment.
- Modification of collagen hydrolysate with natural polymer as retanning agent through simple polymerisation.
- Developed syntan will be utilised as a retanning agent (syntan) during the post tanning process.
- Crust leather made out of developed syntan showed good tight grain and better fullness.

Salient Features / Highlights / Advantages

- Better utilisation of leather industry solid waste byintegration ofproteinous waste and polysaccharides.
- Replacement for phenol and formaldehyde type syntan.
- Better compatible with conventional post tanning chemicals like syntans, vegetable tannins and fatliquors.
- Good quality leathers can be produced by using this bio-polymeric syntan as an alternative to commercial toxic syntan in leather wet end processing.
- 50% reduction in the TS load.

Commercialization Status / Techno - Economics:

- Status of commercialization : This technology is ready for commercialization
- Validation level: This technology has been up scaled to 5kg production scale at the pilot plant facility of CSIR-CLRI.
- Handholding support: Training, Demonstration, Technology Document, Trouble Shooting, Technology Implementation

Protein Syntan and crust leather

Recent Publications from CSIR-CLRI

1	Ramesh, RR; Arathanaikotti, D; Abu Javid, M; Vijayarangan, K; Rathinam, A, Studies on the Fabrication of Hydrophobic Coating Incorporating Bentonite Clay and its Effect on the Physical Properties of the Finished Leather, JOURNAL OF THE AMERICAN LEATHER CHEMISTS ASSOCIATION, 118 (2), 67-74, 2023
2	Dayanidhi, PD; Anithabanu, P; Vaidyanathan, VG, Studies on stabilization of collagen using Cr-doped polydopamine complex, BIOPHYSICAL CHEMISTRY, 292, 2023, 10.1016/j.bpc.2022.106917.
3	Gayathri, V; Lobo, NP; Vikash, VL; Kamini, NR; Samanta, D, Functionalization of Bacterial Cellulose and Related Surfaces Using a Facile Coupling Reaction by Thermoresponsive Catalyst, ACS BIOMATERIALS SCIENCE & ENGINEERING, 9 (2), 625-641, 2023, 10.1021/acsbiomaterials.2c01338.
4	Preethy, KR; Ganesan, P; Chamundeeswari, M, Multimodality: phantom imaging for superparamagnetic graphene composites using green technology for theranostic nanosystems, APPLIED PHYSICS A-MATERIALS SCIENCE & PROCESSING, 129 (1), 2023, 10.1007/s00339-022-06327-w.
5	Ahmad, A; Priyadarshini, M; Das, I; Ghangrekar, MM; Surampalli, RY, Surfactant aided electrocoagulation/flotation using punched electrodes for the remediation of salicylic acid from wastewater, JOURNAL OF ENVIRONMENTAL CHEMICAL ENGINEERING, 11 (1), 2023, 10.1016/j.jece.2022.109049.
6	Janeena, A; Nagabalaji, V; Suresh, P; Ramudu, KN; Srinivasan, SV; Shanmugam, G; Ayyadurai, N, Engineering microbial cells with metal chelating hydroxylated unnatural amino acids for removable of synthetic pollutants from water, CHEMOSPHERE, 311, 2023, 10.1016/j.chemosphere.2022.136756
7	Nandan, A; Sharma, V; Banerjee, P; Sadasivam, K; Venkatesan, S; Prasher, B, Deciphering the mechanism of Tinospora cordifolia extract on Th17 cells through in-depth transcriptomic profiling and in silico analysis, FRONTIERS IN PHARMACOLOGY, 13, 2023, 10.3389/fphar.2022.1056677.
8	Ramesh, S; Karthikeyan, C; Hajahameed, AS; Afsar, N; Sivasamy, A; Lee, YJ; Kim, JH; Kim, HS, Nanorod-like Structure of ZnO Nanoparticles and Zn8O8 Clusters Using 4-Dimethylamino Benzaldehyde Liquid to Study the Physicochemical and Antimicrobial Properties of Pathogenic Bacteria, NANOMATERIALS, 13 (1), 2023, 10.3390/nano13010166.

MoU signing with I K Gujral Punjab Technical University, Jalandhar

CSIR-CLRI signed a MoU with I.K Gujral Punjab Technical University (IKG PTU) to strengthen university's academic capability and collaborative research activities. Dr. P. Sudhakara, Senior Scientist and Dr. S.K Misra, Registrar, IKG PTU exchanged the MoU document on behalf of CSIR-CLRI and IKG PTU respectively. University Dean (R&D) Dr Hitesh Sharma shared various aspects of the MoU and appreciated the previous performance. Dr. S.K.Misra said that efforts will be made to benefit the local leather industry through this MoU.

MoU signing with Troops Comfort Limited-Ordnance Factory, Kanpur

MoU for "*User evaluation of Extreme Cold Weather Protective Gloves for Defence Personnel*" was exchanged between CSIR-Central Leather Research Institute and Troops Comfort Limited-Ordnance Factory, Kanpur at the "***Bandhan Event"*** in AERO India 2023 on 15th February 2023, which was graced by Hon'ble Minister of Defence, Govt. of India and Hon'ble Chief Minister of Karnataka.

DESIGNERS FAIR 2023

CSIR-CLRI participated at the 6th Designers fair conducted by the Council of Leather Exports (CLE) during 1-3 February 2023 at ITC Grand Chola in Chennai. Mrs.Supriya Sahu, IAS Officer, Tamil Nādu Forest Department, inaugurated the event, and Director CSIR-CLRI addressed the gathering. Designers worldwide from 40 countries participated in the event and showcased their products. CSIR-CLRI showcased its different Designs and Technologies, such as Chicken feet leather products, Fish skin products, Palm leaf products, and Leather combinations with banana fabric products, Garments for bikers, and Gloves for strategic sectors.

Mr. K. Karthikeyan, Principal Scientist, and Mrs. K. Ambika, Scientist from Shoe and Product Design Centre, CSIR-CLRI participated in the event. The exhibition attracted various companies and design houses to collaborate with CSIR-CLRI for New Product Development.

Participation in Communication and Dissemination of Traditional Knowledge 2023

CSIR-CLRI participated at the International Conference on "*Communication and Dissemination of Traditional Knowledge (CDTK-2023)*" organised by CSIR-NIScPR at National Agricultural Science Complex (NASC), New Delhi during 14-15 February 2023. Shri V Karthik, Senior Scientist, Regional Centre, Jalandhar and Shri K Karthikeyan, Principal Scientist, Shoe and Product Development Centre represented CSIR-CLRI. Dr. Jitendra Singh, Hon'ble Minister of State for Science and Technology addressed the gathering. Dr N Kalaiselvi, DG, CSIR also spoke on the occasion. CSIR-CLRI showcased some traditional products viz., tote handbags which is made using traditional ethnic textile of North Eastern region, in combination with leather and the traditional Ladakhi shoe popularly known as Pabu Shoes, made from woven yak hair or wool and is often decorated with yak leather. The Hon'ble Minister and DG, CSIR visited the exhibition stalls. Several sessions viz., seminars, poster presentations and workshops were also organised as a part of the Expo.

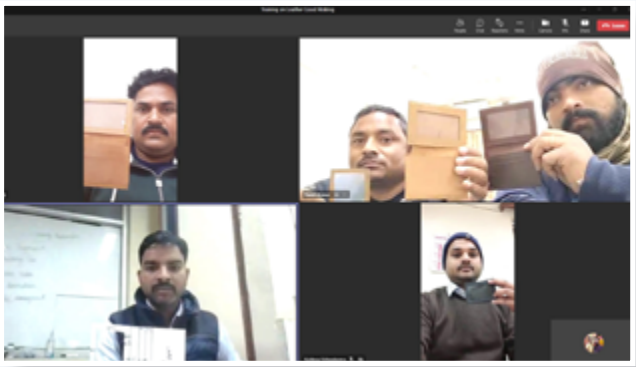
CLRI Regional center at Ahmedabad

CLRI Regional center at Ahmedabad, caters to the needs of various industries such as leather processing, leather products, chemical dye etc in and around Gujarat region. Recently the center has taken up an activity in leather dying, finishing and product making for M/s Alps Chemicals Pvt Ltd, Vatva, Ahmedbad during February 2023. The crust leathers from the customer is dyed according to their need. After property finishing the leathers in various colours product development activity was taken up. Products such as credit card holder, coin purse, laptop case were fabricated and supplied to customer.

Activities at Regional Centre, Kanpur

Training Programme in Leather Goods Making

A three-week training program on leather goods making was conducted through online mode for the technical staff of CLRI Regional Centres Jalandhar and Kanpur. The purpose of the training was to upgrade the skill and expertise of the staff with existing capabilities.



Workshop for validation of action plans of tanneries

A two days' workshop for preparation and validation of individual action plans of 144 tanneries was organised by CPCB/UPPCB during February 07-08, 2023 in Kanpur. Dr S V Srinivasan, Senior Principal Scientist (Environmental Engineering Division) & Mr Abhinandan Kumar, Scientist-In-Charge, CLRI Regional Centre Kanpur participated in the workshop as resource persons on behalf of CSIR-CLRI.

Web Meeting and training of other technical institutes

A web meeting with CPCB officials and other participating technical institutes regarding discussion on inspection of tannery units was held on 16.02.2023. As CSIR-CLRI is the nodal institute for tannery sector, presentations were made by Mr Abhinandan Kumar, SIC, RC Kanpur and Dr S V Srinivasan, Sr Pr Scientist, Environmental Engineering Division to train the experts from other participating technical institutes in this regard.

Signing of Agreements for waterless chrome tanning technology

Agreements for granting license of Waterless Chrome Tanning Technology were signed with the following 32 tanneries in Jajmau, Kanpur.

- M/s Yusuf Enterprises
- M/s Everest Tanners
- M/s Khatoon Tanners
- M/s Navratan Industries
- M/s Ahmad tanning Industries
- M/s Everest Tanning Industries

- M/s Yusuf Enterprises
- M/s Everest Tanners
- M/s Khatoon Tanners
- M/s Navratan Industries
- M/s Ahmad tanning Industries
- M/s Everest Tanning Industries
- M/s Noorullah Tanners
- M/s N.S.Tanners
- M/s Sahara Tanning Industries
- M/s Leather Embossing
- M/s Arafat Tanners
- M/s Top Tanners
- M/s Shariq Tanners
- M/s G.P. Leather
- M/s Nida Tanners
- M/s Farzana Tannery
- M/s Mobin Tanners
- M/s Merit Leather Finishers
- M/s Suleman Tanning Industries
- M/s Sara International
- M/s Star Tanning Industries
- M/s Ishrat Finishers Industries

- M/s Zeba Tanners
- M/s Awadh Tanners
- M/s Mahboob Sons
- M/s New Taj Leather Finishers
- M/s Al-Meezan Tanning Industries
- M/s Crown Tanning Industries
- M/s Merit Leather Product
- M/s Ahmad Leather Industries
- M/s Nagauri Tanning Industries
- M/s Meraj Tanning Industries

Awards & Honour

The AU TVS Centre for Quality Management, Anna University organized Q-Quest 2023, an annual conference on "Quality" for transformation and growth. Mrs B Kanimozhi, Senior Technical Officer, Project Planning, Monitoring and Evaluation (PPME) Department, CSIR-CLRI participated in "The 5 S presentation" held as part of Q-Quest 2023 on 7th February 2023 at Anna University and has won the "Bronze Award".

Workshop on Government e-Marketplace (GeM)

Organised by CSIR-CLRI jointly with CSIR-HRDC

CSIR-Central Leather Research Institute conducted a workshop on 13th February 2023 on Government e-Marketplace (GeM) jointly with CSIR-HRDC, Ghaziabad. About 50 officials from CSIR-SERC, Chennai, CSIR-NAL, Bangalore, CSIR-CECRI, Karaikudi, CSIR-CFTRI, Mysore, CSIR-NIIST, Trivandrum, CSIR Madras complex, and CSIR-CLRI, Chennai, participated in the workshop. The program was inaugurated in the presence of Dr. K.J. Sreeram, Director, CSIR-CLRI, Dr. Vinay Kumar, Senior Principal Scientist, CSIR–HRDC, Ghaziabad, and Mr. Ramesh Mahadevan, GeM Consultant & Business Facilitator for Tamil Nadu. Dr. Sujata Mandal, Senior Principal Scientist, CSIR-CLRI, welcomed the guests and the trainee officials. Dr. Vinay Kumar briefed the programme, and Mr. Ramesh Mahadevan, briefed about the GeM to all the officials. Dr. K.J. Sreeram, in his inaugural address, emphasized the importance of GeM training to the CSIR officials for the smooth functioning of the Institute. At the end of the inauguration program, Mr. H.V. Sundar, Senior CoSP, CSIR-CLRI, proposed the vote of thanks.

The first technical session was an overview of GeM and objectives: GFRs 2017, Rule 149 for GeM, workflow and timeline of GeM, which was explained by Mr. Ramesh Mahadevan. In the second session, he described the GFR 2017 on Procurement of Goods, which continued in the post lunch session.

The last session of the programme was a hands-on practice in the Procurement of Goods/Services on GeM Portal. This hands-on executive training was designed to help them have a better understanding of GeM portal. After the session, feedback on the workshop was asked from the trainee officials. The workshop ended with a vote of thanks by Mr E Mahesh Kumar, CoSP, CSIR-CLRI.

CSIR Integrated Skill Initiative Programme

CSIR-Human Resource Development Centre (CSIR-HRDC) conducted a coordinators' conclave-cum-workshop for the "***CSIR Integrated Skill Initiative Programme***" in association with the CSIR-National Institute of Oceanography, Goa, during 16-17 February 2023. On behalf of CSIR-CLRI, Dr. Swarna V Kanth, Senior Principal Scientist, and Dr. Sujata Mandal, Senior Principal Scientist, participated in the workshop.

Prof. Sunil Kumar Singh, Director, NIO-GOA, briefed about the role of CSIR in skill development. Dr. Vinay Kumar provided an update on the program's various activities. Mr. Sanjeeva Singh discussed the ways and means for CSIR and NSDC to collaborate in improving the skill ecosystem. Prof. B.K. Mishra, the chief guest, delivered the inaugural address. He emphasized the importance of skilling and upskilling with the advancement of information technology.

The first technical session was on "Effective implementation of CSIR's Integrated Skill Initiative-Role of ASCI" by Dr. Satender Singh Arya, CEO, Agriculture Sector Skill Council (ASCI). He emphasized on the collaboration of ASCI with CSIR for the skill development programs. The technical session on "*Effective execution of CSIR's Integrated Skill Initiative—Role of LSSSDC*" was given by Mr. Anshul Saxena, Sr. Director, Life Sciences Sector Skill Development Council (LSSSDC). Dr. Rajeev Mehajan, Scientist G, Science & Engineering Research Board (SERB), explained the newly launched program "*Accelerate Vigyan: Expanding Research Pace in the Country*" by SERB, and how the skill training programs can be linked to the SERB's "*Accelerate Vigyan*" program. The final session of the day was about the "*Success Stories and Bottlenecks*" in implementing and running the CSIR Integrated Skill Initiative Programme by the respective lab nodal person from each CSIR laboratory under the biological sciences cluster. The nodal person from each CSIR laboratory shared their achievements and the constraints faced in various stages starting from getting QP numbers, uploading documents in the portal and finance-related issues.

The final session of the conclave was on "I*ndian S&T Landscape with Special R&D Funding Opportunities in SERB*" by Dr. Rajeev Mehajan, Scientist G, SERB, followed by a valedictory address by Prof. Sunil Kumar Singh, Director, CSIR-NIO, Goa.

CSIR scientists from 37 Laboratories and the dignitaries in the Coordinators' Conclave-cum-Workshop held in The International Centre Goa.

LEATHERPRENEUR 2023

Frontline Leaders and Young Entrepreneurs' Resource for start-ups is an Entrepreneurial Club of the students of the Department of Leather Technology, AC Tech, Anna University. It aims to foster Entrepreneurial skills of the students and encourage start-ups in the Leather & Allied Sectors.

The Club organized an event "**LEATHERPRENEUR'23**" on 17th February 2023 connecting connect the students with the Young Entrepreneurs of the Leather & Allied Sectors. Dr B Madhan, Head, CARE, CSIR-CLRI & Professor Dept. of Leather Technology, AC Tech, Anna University welcomed the gathering. Dr. KJ Sreeram, Director, CSIR-CLRI & Head, Dept. of Leather Technology, AC Tech, Anna University in his inaugural address emphasised the importance of intercalation of different sectors to generate new entrepreneurial ideas. He mentioned that CSIR-CLRI has signed an agreement with NRDC to initiate an incubation hub by this year end to nurture the start-ups through funds and other support. Dr. R Jayavel, Dean, AC Tech, highlighted the importance of innovation as an integral component for industrial development.

Dr. Chalapathy Kora, Chairman, Ajanta Shoes in his Keynote address reminisced his journey from small leather unit to an industry with 1500 employees making 2 lakhs pair of shoes per annum. Mr. Naveed Ahmed, Director and Co-founder, SynerHeal Pharmaceuticals, spoke on the various issues that needs to be addressed to become a successful entrepreneur. Mr. Ajit Mathai, founding partner, mByom, shared his experiences in making mByom. He highlighted marketing and finance as the major constrains for the start ups.

A Panel discussion on the topic “Opportunities for Young Entrepreneurs in Leather Sector” was chaired by Mr. Sivashankar, Partner, Zeal Tanners. Alumni of the department Ms. Rammiya M S, Assistant Director (Leather and Footwear), MSME Testing Centre, explained the role of MSME work and the benefits to the users. Mr Balaji R P, Skywalk Shoe Industries, encouraged the students to choose the trade where one can shine. Mr. Siddarth Rajha, General Manager, Sai Chamois, advised to try different opportunities and learn from it. Mr. Mohammed Khizer S E, Partner, Syed Leather Company shared the difficulties faced by him in business are Management skills and financial skills. He encouraged students to strengthen in this area. Mr. Abishek J, Business Development Executive, Gokul Raam Leathers, explained about his start-up called skinware India,. Mr. Joe Arun J, CEO, Lecaso discussed the opportunities in marketing industry and future of young entrepreneurs. Dr. B Chandrasekaran, Distinguished Scientist, CSIR-CLRI and many other faculty members of the department participated in the programme and encouraged the students to choose appropriate model and skills to be successful in their journey of taking up entrepreneurship.

The Chairperson, Mr. Sivashankar, Partner, Zeal Tanners, spoke on his journey as an entrepreneur and the huge opportunity in leather sector especially in Europe. Mr. Mohammed Arshad Khan, Co-founder, COO of findmyleather.com, traced his journey as a start up. Mohamed Rishwan M, President, FLYERS, delivered the vote of thanks

EMERGING TRENDS IN MATERIALS

CSIR-Central Leather Research Institute conducted an International Training Workshop in association with the Centre for Science and Technology of the Non-aligned and Other Developing Countries (NAM S&T Centre), New Delhi, on "***Emerging Trends in Materials, Design, Innovation and Intelligent Manufacturing of Footwear and Leather Products in Developing Countries***". More than 50 participants from ten countries namely Egypt, India, Indonesia, Mauritius, Myanmar, Nigeria, Palestine, Sri Lanka, Uganda and Vietnam attended the workshop held during 30 - 31 January 2023. With five technical sessions, 6 keynote lectures and 21 technical presentations, the workshop greatly benefited the participants with an overview on the current trends in the field. The programme was co-sponsored by the Indian Leather Technologists' Association – Southern Region (ILTA-SR) and LERIG Trust.

Dr. K. J. Sreeram, Director, CSIR-CLRI, Chennai welcomed the participants and gave a brief overview about the workshop. Dr. Amitava Bandopadhyay, Director General, NAM S&T Centre, New Delhi addressed the gathering on the core theme of the training programme Mr. P.R. Aqeel Ahmed, Chairman, Leather Sector Skill Council, Chennai, shared his insights on global scenario in the arena of footwear and leather products. Mr. N.R. Jagannathan, President, ILTA (Southern Region), Chennai, spoke on new leather product innovations. A souvenir on the theme was released by Mr. P.R. Aqeel Ahmed. The session concluded with a vote of thanks by Dr. P. Thanikaivelan, Chief Scientist, CSIR-CLRI.

Day 1 | Technical session I

"***Emerging Scenarios in New Material Innovations***". Delivering the keynote lecture, Mr. V. Muthukumaran spoke on the circular economy implications and impact of sustainability concepts on footwear industries. Mr. P.S. Sureshkumar, Senior Principal Scientist, CSIR-CLRI India spoke on "Using Natural Fabrics as Alternative Materials in Footwear Production". Mrs. K. Ambika, Scientist, CSIR-CLRI India, presented on the subject "*Design & Development of Palm Leaf and Leather Combination Products- A New Makeover to Indian Palm Leaf Crafts*". Mr. Raden Agus Sampurna, from Indonesia, shared his on the commercialization of Leather Based Technologies. Dr. Than Than Aye, from Myanmar, spoke on "*Investigation for Preparation of Wild Riding Boots by Foot Wear Recycling Process".*

Day 1 | Technical session II

"Intelligent Manufacturing including Artificial Intelligence and Industry 4.0 Concepts". Mr. M. Elangovan delivered a keynote address on the topic "*3P and IoT in Footwear Industry"*. Mr. Ramesh Subramanian, Formerly Executive Director FDDI, India spoke on "*Intelligent Manufacturing including Artificial Intelligence and Industry 4.0 concepts*". Dr. D. Suresh Kumar, Scientist, CSIR-CLRI presented on the topic '*Automation of Footwear Design & Manufacture Using Sophisticated CAD/CAM Tool'*. Mr. S. Nithiyanantha Vasagam, Senior Principal Scientist, CSIR-CLRI, made a presentation on '*Prediction of India's Leather Footwear Export for the year 2030 in terms of Quantity using Recurrent Neural Network based Model'*. Mr. Vishnu Kumar, Scientist, CSIR-CLRI spoke on the topic '*Towards Next-generation Manufacturing in Footwear Industry'*. Mr. Asem G. Abuomar, from Palestine made a presentation on 'Leather and Shoes in Palestine-Leather and Shoe Cluster'.

Day 2 Technical session III

"Trends in The Design of Footwear and Leather Products and Accessories for Fashion and Value Addition". Dr. Kaustav Sengupta delivered the keynote address on "*Trends in the Design of Footwear and Leather Products*". He spoke on recent developments and the growing trends in the fashion segment. Mr. M. Akshaya Raman made a presentation on "*Standardisation of Leather Product Sample Development Process through Industrial Engineering Techniques*". Mr. K. Karthikeyan, Principal Scientist, CSIR-CLRI spoke on "*Additive Manufacturing Driven Fashion Products Design and its Futuristic Applications in Wearable Lifestyle Accessories Exclusively for Footwear Sector*". Dr. (Mrs.) Anagha Vaidya Soocheta, from Mauritius presented on the topic "*Eco-Design Modular Flat Pack Travel Shoes*". She also demonstrated the practical application of shoes where the sole and the shoe can be attached and detached using zippers and Velcro. Dr. G. Saraswathy, Senior Scientist, CSIR-CLRI spoke on "*Footwear Based on Persons Gait: Recent Trend in the Design of Footwear*". Mrs. K. Ambika, Scientist, CSIR-CLRI presented on "*Design Interventions for Sustainable Fashion Lifestyle Products – A Case Study on Project GOAT by CSIR-CLRI*".

Day 2 | Technical session IV

"Quality Control, Testing, and Standards for Materials in Footwear and Leather Products". In his keynote lecture Mr. C. Anbu Malar spoke on the topic "*Quality Control, Testing and Standards for Leather in Footwear and Leather Products*". He addressed the quality measures, wastewater treatment systems for tanneries and the cleaner process methodologies being employed in leather making. He also gave insights on bio-based products which can be made from hides and skins. Mr. C. M. Rajesh, Scientist, CSIR-CLRI presented on the topic entitled "*Quality Control in Footwear Using Best Practices*". Mr. G. Bharath Kumar, Scientist, CSIR-CLRI, presented on "*Physical Testing Standards for Footwear Components*". Mr. Tran Van Vinh and Mr. Le Quang Tuan, from Vietnam shared their views on "*Vietnam's Leather and Footwear Industry: Overview Status Report and Circular Economy Trend*". Mr. Lutalo Richard Bosco, from Uganda presented on "*Uganda's Efforts to Support MSME's in the Leather Sub-Sector: The Case of the Technology Innovation and Business Incubation Centre (TIBIC)*".

Day 2 | Technical session V

"***Ethics, Social Responsibility and Sustainability for the Manufacturing Sectors"*** Mr. M. Abdul Wahab gave the keynote lecture on "Ethics, Social Responsibility and Sustainability for the Manufacturing Sectors". He highlighted the real-time scenario at the tanneries of across India. Mr. Jerry Tagang, from Nigeria, presented on the topic "*Investigation into Preferred Type of Footwear Out-Sole for People Living with Diabetics*". Mr. Suresh Aluvihara, from Sri Lanka, spoke on "An Advanced Review on the Impact of Leather Tannery Waste Materials on the Environment and Mitigation Methods".

Prof. S. S. Dutta Memorial Lecture

The S.S Dutta Memorial Lecture is conducted every year in the honour of late Prof. S.S Dutta. The 4th in the series was organised by The Indian Leather Technologist Association (ILTA) on 2nd February 2023 during the 36th India International Fair in Chennai. Mr N.R Jaganathan, President, Southern region ILTA made the welcome address. Dr. K.J Sreeram, Director, CSIR-CLRI delivered the 4th Prof. S.S Dutta Memorial Lecture. He spokeon the opportunities and scope of leather for newer leather industry. He emphasised the current market scenario of the leather sector, future trends with respect to sustainability, green processing of leathers and the innovative ways of use of materials for the leather products domain. He discussed various initiatives taken by the government for the promotion of leather handicrafts and leather toys. Mr. Susanta Mallick, General Secretary ILTA briefed about Prof. SS Dutta and achievements. Dr T Ramasami, Former Secretary, Department of Science and Technology, GoI addressed the gathering highlighting the importance of leather education.

The S.S Dutta Memorial Medal was given to the most innovative projects by students of B.Tech in Leather Technology and M.Tech in Leather Technology and Footwear Engineering and Management.

- Ms. Afreen A, Ms. Aanandhi S, and Ms. Azagu Parvathi K students of B.Tech Leather Technology from Anna University received the award for the most innovative project on "*Manufacturing of Playing cards using leather*."
- Ms. Sarika Kumari, M.Tech Footwear Engineering and Management, Anna University received the award for her most innovative project on "*Design and development of innovative footwear from waste emerging from footwear industry.*"
- Ms. Kritika Vagmi, M.Tech from Maulana Abul Kalam Azad University of Technology received the award for her most innovative project on "*Antifungal screening of methanolic extracts: A promising approach towards development of antifungal phytochemicals for leather application*."
- Mr. Saumijit Das from Maulana Abul Kalam Azad University of Technology received the award for his most innovative project on "*Hair on tanning of rabbit skins.*"

The best exporter's award during the year 2021-2022 was announced. The winners are:

- M/s Feng Tay – Tamil Nadu, India
- M/s KH Exports (II) Pvt, Ltd – Tamil Nadu, India
- M/s Tata International Group Tamil Nadu, India

Hon'ble Minister of States (Commerce and Industry)
Interaction meet with Punjab Leather sector stakeholders

CSIR-CLRI participated in the Interaction of Hon'ble Minister of States (MoS) for Commerce and Industry (C&I) with representatives of Leather & Footwear entrepreneurs of Punjab at Vanijya Bhawan, New Delhi on 13th February 2023. Shri. Som Prakash, Hon'ble MoS (C&I) chaired the meeting, Shri Rajeev Singh Thankur, Additional Secretary, DPIIT, Mr. Hira Lal Verma, President of Punjab Leather Federation (PLF), Vice President and members of PLF, Shri Moti Lal Sethi, Regional Chairman (North), Council for Leather Exports (CLE), Mr. Atul Kumar, Regional Director, CLE, Shri. Arun Kumar, M.D, FDDI, representatives of IFCOMA participated in the meeting. Shri P S Suresh Kumar, Sr. Pr. Scientist and Shri V Karthik, Senior Scientist represented CSIR-CLRI

Shri Moti Lal Sethi, Regional Chairman (North), CLE highlighted that the export growth of the Punjab leather industry declined by 22% than the previous year. DPIIT gave a presentation on various government schemes offered to leather sector. Hon'ble MoS noted the critical points of the presentation. Issues such as the functioning of CETP, extension of IDLS application timeline, financial support on CETP upgradation and support in exploring markets through participation in international leather fairs were discussed. DPIIT will address these issues and industry was advised to submit proposals to DPIIT wherever financial support is sought from the government. DPIIT will to schedule a meeting with the concerned minister at the State Government.

Shri. B.Ramanaiah
Leather Process Technology
Principal Technical Officer

Happy Retirement

Shri. Bidyut Bal
Regional Centre, Kolkata
Sr. Technician (2)

The Director and Staff wish them a happy and healthy retired life

About 14 students (pursuing M.Sc., Biochemistry/Biotechnology), and two faculty members from School of Bioscience & Technology, Vellore Institute of Technology, Vellore, visited CSIR - Central Leather Research Institute on 9th February 2023. The students interacted with CSIR-CLRI Scientists/staff of Leather Processing Technology, Biochemistry and Biotechnology and Animal House. Students and faculty members found the visits very useful and highly informative.

Around 15 students pursuing B.Tech Fashion Technology from VIT, Chennai visited CSIR-CLRI on 9th February 2023.They were briefed by the scientist on Leather Goods/Garments, CAD Designing, Leather Processing Technology and related research activities at the institute.

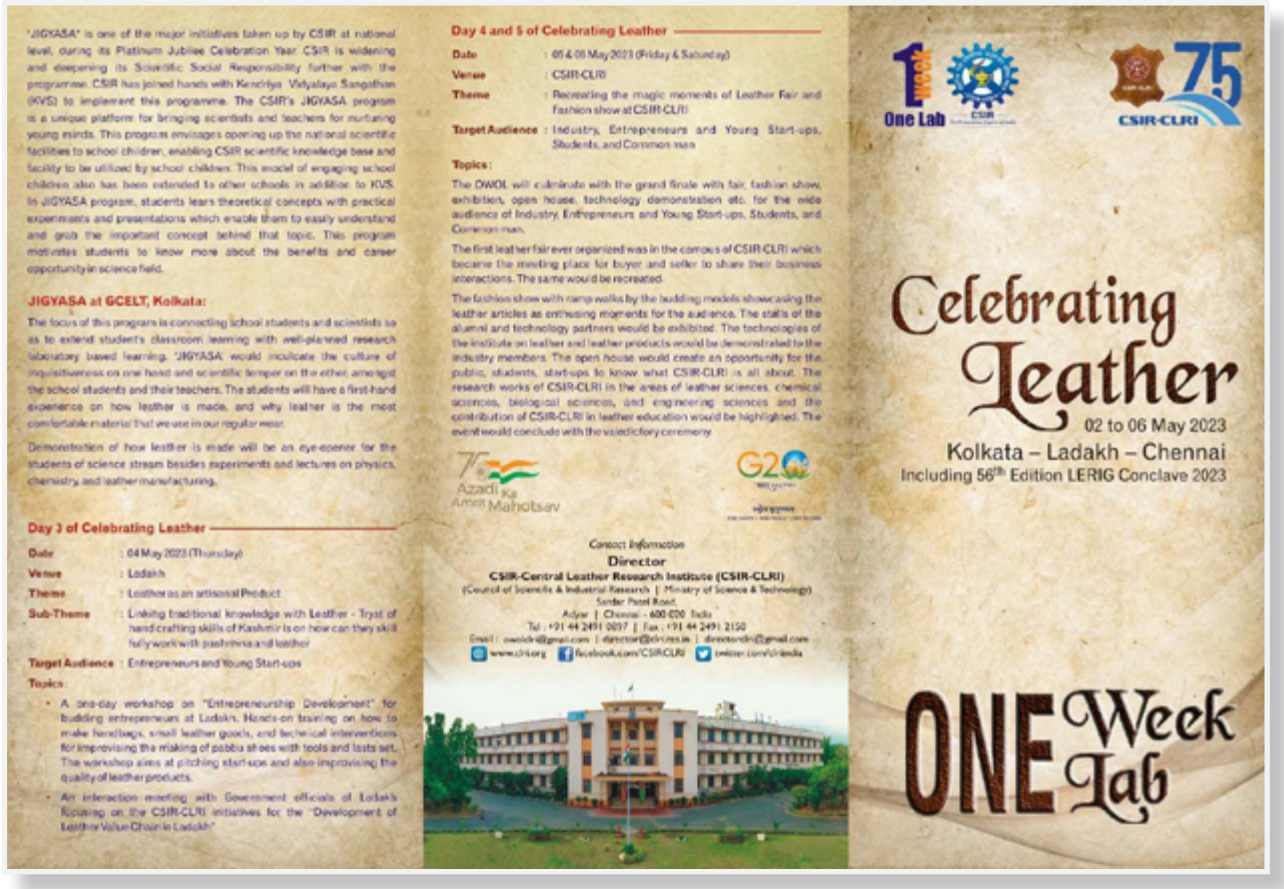
Around 69 students pursuing B.E Computer Science and Engineering from VIT, Chennai visited CSIR-CLRI on 8th February 2023.They were briefed by the scientist of Leather Processing Technology, Glass Blowing Department.

About 45 students of B.Sc, Chemistry and 3 faculties from Sri GVG Visalakshi College for women, Udumalpet visited CSIR-CLRI on 16th February 2023.They were briefed by the scientist of, Leather Processing Technology, Environmental Engineering and Biochemistry & Biotechnology Divisions.

About 110 students and 4 faculty members of B.E/ B.Tech Computer Science & Business System from R.M.K. Engineering College, Kavaraipettai, around, visited CSIR-CLRI on 22nd February 2023. The students visited Engineering Services Department – Glass Blowing Section, Shoe & Product Design Centre, Knowledge Portfolio Management Department and Leather Processing Technology.

CSIR - One Week One Lab (OWOL) - Central Leather Research Institute

The Curtain Raiser of One Week One Lab (OWOL) event of CSIR-CLRI was launched on 2*nd* February 2023 at India International Leather Fair (IILF) 2023, Chennai.



"JIGYASA" is one of the major initiatives taken up by CSIR at national level, during its Platinum Jubilee Celebration Year. CSIR is widening and deepening its Scientific Social Responsibility further with the programme. CSIR has joined hands with Kendriya Vidyalaya Sangathan (KVS) to implement this programme. The CSIR's JIGYASA program is a unique platform for bringing scientists and teachers for nurturing young minds. This program envisages opening up the national scientific facilities to school children, enabling CSIR scientific knowledge base and facility to be utilized by school children. This model of engaging school children also has been extended to other schools in addition to KVS. In JIGYASA program, students learn theoretical concepts with practical experiments and presentations which enable them to easily understand and grab the important concept behind that topic. This program motivates students to know more about the benefits and career opportunity in science field.

JIGYASA at GCELT, Kolkata:

The focus of this program is connecting school students and scientists so as to extend student's classroom learning with well-planned research laboratory based learning. "JIGYASA" would inculcate the culture of inquisitiveness on one hand and scientific temper on the other, amongst the school students and their teachers. The students will have a first-hand experience on how leather is made, and why leather is the most comfortable material that we use in our regular wear.

Demonstration of how leather is made will be an eye-opener for the students of science stream besides experiments and lectures on physics, chemistry and leather manufacturing.

Day 3 of Celebrating Leather

Date : 04 May 2023 (Thursday)
Venue : Ladakh
Theme : Leather as an artisanal Product
Sub-Theme : Linking traditional knowledge with Leather - Tryst of hand crafting skills of Kashmir is on how can they skill fully work with pashmina and leather
Target Audience : Entrepreneurs and Young Start-ups
Topics:

- A one-day workshop on "Entrepreneurship Development" for budding entrepreneurs at Ladakh. Hands-on training on how to make handbags, small leather goods, and technical interventions for improvising the making of pabbu shoes with tools and lasts set. The workshop aims at pitching start-ups and also improvising the quality of leather products.
- An interaction meeting with Government officials of Ladakh focusing on the CSIR-CLRI initiatives for the "Development of Leather Value Chain in Ladakh"

Day 4 and 5 of Celebrating Leather

Date : 05 & 06 May 2023 (Friday & Saturday)
Venue : CSIR-CLRI
Theme : Recreating the magic moments of Leather Fair and Fashion show at CSIR-CLRI
Target Audience : Industry, Entrepreneurs and Young Start-ups, Students, and Common man
Topics:

The OWOL will culminate with the grand finale with fair, fashion show, exhibition, open house, technology demonstration etc. for the wide audience of Industry, Entrepreneurs and Young Start-ups, Students, and Common man.

The first leather fair ever organized was in the corridors of CSIR-CLRI which became the meeting place for buyer and seller to share their business interactions. The same would be recreated.

The fashion show with ramp walks by the budding models showcasing the leather articles as entrancing moments for the audience. The stalls of the alumni and technology partners would be exhibited. The technologies of the institute on leather and leather products would be demonstrated to the industry members. The open house would create an opportunity for the public, students, start-ups to know what CSIR-CLRI is all about. The research works of CSIR-CLRI in the areas of leather sciences, chemical sciences, biological sciences, and engineering sciences and the contribution of CSIR-CLRI in leather education would be highlighted. The event would conclude with the valedictory ceremony.

Azadi ka Amrit Mahotsav

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One Week One Lab | CSIR | CSIR-CLRI 75

Celebrating Leather
02 to 06 May 2023
Kolkata – Ladakh – Chennai
Including 56th Edition LERIG Conclave 2023

ONE Week Lab

Shri Narendra Modi
President, CSIR
Hon'ble Prime Minister of India

Dr Jitendra Singh
Vice President, CSIR
Hon'ble Minister of Science & Technology

Dr N Kalaiselvi
Director General, CSIR and Secretary, DSIR

Dr K J Sreeram,
Director, CSIR-CLRI

Director's Message

The CSIR-Central Leather Research Institute (CLRI) is 75 years old. We are perhaps the only institution in the world who has had the fortune of shaping an industry through R & D. Indian leather industry is today an over 10 USD billion industry and the handholding of CSIR-CLRI in the growth of the sector continues. Under the One Week One Lab program launched by Dr Jitendra Singh, the Hon'ble Minister for S & T, CSIR-CLRI will be reaching out to students, the youth, the upcoming entrepreneurs, the policy makers, and the leather industry to showcase our success stories of 75 years journey and to understand their expectations out of us in the next 25 years. The One Week One Lab program of CSIR-CLRI kickstarts on 02 May 2023 at Kolkata with a conclave of Leather Research Industry and Government, and JIGYASA students - scientists interaction, and continues with entrepreneurial workshop in Ladakh to recreating leather fair and fashion shows at CSIR-CLRI campus and much more.

निदेशक महोदय का संदेश

One Lab | CSIR | CSIR-CLRI 75

CSIR-CLRI
One Week One Lab Event
02 to 06 May 2023

One Week One Lab (OWOL):

About: "One Week One Lab", a theme-based campaign of Council of Scientific & Industrial Research (CSIR), is expected to ignite the minds of young innovators, students, Start-ups, academia, and industry to look for opportunities through deep-tech ventures.

Key Objective: In the One Week, One Lab Campaign, various institutes of CSIR, one after the other in every successive week, will showcase their exclusive innovations and technological breakthroughs to the people of India.

Participation: Each of the 37 premier Laboratories/Institutes of CSIR spread across the country will participate in the CSIR's One Week, One Lab Campaign.

Parent Ministry: One Week, One Lab Campaign is being organized under overall guidance and supervision of Ministry of Science & Technology.

CSIR-CLRI's One Week One Lab:

CSIR-CLRI has planned a week-long programme of One Week One Lab (OWOL) during **02 to 06 May 2023** under the theme **"Celebrating Leather"** reaching out to all fraternities of Leather including Students, Government, Industry and to the Common man. The OWOL program includes LERIG Conclave 56th edition at Kolkata, events for Students, Start-ups, Government and Industry at Kolkata, Ladakh and Chennai. CSIR-CLRI has also planned a grand finale on a culmination way on 06 May 2023 at CSIR-CLRI, Chennai campus that comprises Fair, Fashion show and much more.

CSIR-CLRI has contemplated to organize the events as per the schedule given below:

Day 1 (02 May 2023)	56th Edition of LERIG Conclave 2023 at Kolkata
Day 2 (03 May 2023)	Interaction with School and College students at Government College of Engineering and Leather Technology (GCELT), Kolkata.
Day 3 (04 May 2023)	Entrepreneurship workshop and Interaction Meet with Government officials at Ladakh
Day 4 (05 May 2023)	Public Roadshow - Recreating Leather Fair inside the campus at CSIR-CLRI - Stalls of alumni and technology partners - Entrepreneurial activities of B Tech and M Tech students - Fashion Show
Day 5 (06 May 2023)	- Crosslinx (International Symposium of B Tech Students)

Day 1 of Celebrating Leather

Date : 02 May 2023 (Tuesday)
Venue : Bantala Leather Complex, Kolkata
Theme : LERIG Conclave under Theme "Science, Research, Innovation System for High Trade benefits to India (SRISHTI)"
Sub-Theme : Novel solutions/products for leather and leather goods/accessories industries
Target Audience : This day is targeted for the tanners and product manufacturers of Kolkata through technologies of CSIR-CLRI
Topics:

- Extreme cold weather Protection Gloves
- Chicken Feet Leather
- Natural Fibres
- Waterless Chrome Tanning Technology
- Utilization of chrome shavings for the manufacture of Basic Chromium Sulfate (BCS)
- Indian Footwear Sizing System
- Protective Apparel for the Bikers

Interestingly, some of the above technologies have been used by the industries and we have the eminent speakers, expressing their views on the way forward 'Technology led Innovation'.

Day 2 of Celebrating Leather

Date : 03 May 2023 (Wednesday)
Venue : Government College of Engineering and Leather Technology (GCELT), Kolkata
Theme : Leather that Weathers
Sub-Theme : Leather - The first fabric ever worn by man
Target Audience : School and College students of Kolkata includes students of GCELT
Topics:

- Leather Science Demonstration series – A workshop for the science streams students to know about leather and leather products for which their state/city is famous for.
- Demonstration of experiments on physics, chemistry, and leather

Reaching out to the students has been the endeavour under the JIGYASA initiative.

About JIGYASA

JIGYASA – Promoting scientific temper through Student Scientist Connect Program. The JIGYASA programme is inspired by the Hon'ble Prime Minister Narendra Modi's vision of a New India and Scientific Social Responsibility (SSR) of Scientific Community and Institutions.

CSIR-Central Leather Research Institute

(CSIR Integrated Skill Initiative Training Programme)

CSIR-CLRI announces the commencement of the following placement oriented courses

Leather Processing

- Post Graduate Diploma Programme in Leather Technology
- Diploma in Leather Processing
- Short Term Executive Skill Development Programme in Leather Processing
- Integrated Skill Development on Quality Control Methods in Leather Manufacture
- Computerized colour Matching for Leather manufacturing

Leather Goods and Garments

- Diploma in Leather Goods Manufacture
- Short Term Executive Skill Development Programme in Leather Goods Manufacture
- Training Programme in Leather Goods Design (Manual and CAD)
- Diploma in Leather Garment Manufacture
- Short Term Executive Skill Development Programme in Leather Garments manufacture
- CAD for Garments

Leather Allied Sectors

- Short Term Executive Training Programme on Occupational Health and Safety for Leather and Allied (Product) Industries
- Short Term Executive Training Programme on Testing and Calibration for Leather Sector
- Repair, restore and maintenance of leather products
- Short Term Executive Training Programme on Waste Management for Leather Sector

Leather and Leather products

- Post Graduate Diploma Programme in Leather Products Technology
- Quality and Visual Inspection of Leather and Leather Products
- Skill Training Programme in Leather and Leather-like materials for Emerging Entrepreneurs
- Short Term Executive Skill Development Programme in Leather Upholstery Manufacture
- Course in Fashion Design and Development for Leather Lifestyle Products

Allied Science courses

- Bioinformatics Associate/ Analyst
- Quality Control Chemist – Microbiology
- QA Chemist Equipment Validation - Life Sciences
- Nuclear Magnetic Resonance (NMR) Spectroscopy Analyst
- Quality Assurance Chemist
- Leather Biotechnologist
- Enzyme Technologist
- Structural Analytical Technologist
- rDNA Technologist

Footwear

- Diploma in Footwear Manufacture
- Short Term Executive Skill Development Programme in Footwear manufacture
- Training programme in GAIT Analysis
- CAD for Footwear

Please visit https://clri.org/training.aspx for online / offline submission of duly filled in application

CSIR-CLRI 75

For more info:
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Srinivetha Pathmanapan


Sathya U


Sathya U


Yasmin Khambhaty

CAMPUS life @ CSIR-CLRI

CSIR-CLRI

Striving for Excellence and
Global Leadership in Leather Technology

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