Workshop on “Cutting-Edge Scientific Instruments and Training on XRD, ICP-MS, BET and Multichannel Electrochemical Workstation” at University of Ladakh, UT of Ladakh

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Received: 23 April 2024 / Revised form Accepted: 27 May 2024
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Not less than a breakthrough, the University of Ladakh bagged the highly esteemed PURSE grant (Promotion of University Research and Scientific Excellence) of Rs.6.78 Crores from DST (Department of Science & Technology), Government of India (SR/PURSE/2022/122, dated 01/03/2023) for four years. The University’s rare feat comes as a recognition of its commitment to establish a state-of-the-art instrumentation facility i.e. ‘Centralized Interdisciplinary Science Instrumentation Centre (CISIC)’ for advanced research in the only Trans-Himalayan Institute of Higher Learning and Research in Ladakh Region. Most of the instruments are installed in this high-altitude region of the world for the first time. Scientific research relies heavily on advanced instrumentation to unravel the complexities of nature, analyze materials with precision, and explore new frontiers of knowledge. Instruments such as XRD, ICP-MS, BET, Multichannel Electrochemical Workstation etc play a pivotal role in this endeavour. Recognizing this need, the University of Ladakh, under the PURSE grant organized a National Workshop from 22nd to 23rd of March 2024 to provide researchers with valuable insights and skills in operating these cutting-edge instruments, thereby, fostering a culture of innovation and advancement.

The primary objectives of the National Workshop have been two fold: (i) to support the professional development of participants by equipping them with the skills and expertise in the operation of XRD, ICP-MS, BET and Multichannel Electrochemical Workstation, in particular; (ii) to create a platform for networking, knowledge-sharing, and exchange of ideas among participants from different disciplines, on emerging trends, challenges, and opportunities in the field of scientific instrumentation and research.

Demonstration of the sophisticated analytical instruments were conducted by industry professionals and experienced scientists, offering participants hands-on training in the operation of the instruments and follow-up analysis of data.

The Workshop attracted more than 100 participants from various organizations, including the University of Ladakh and its constituent colleges across Leh-Ladakh region, Defence Institute of High Altitude Research (DIHAR)-DRDO, University of Kashmir, Jai Prakash University, Central University of Himachal Pradesh, Central Arid Zone Research Institute (CAZRI)-ICAR, Govind Ballabh Pant National Institute of Himalayan Environment (GBP-NIHE), Sher-e-Kashmir University of Agricultural Sciences and Technology (SKUAST), ICICI Foundation for Inclusive Growth, and Panjab University, Chandigarh.

The Workshop comprised keynote talks, technical sessions, and practical demonstrations conducted by experts.

Day 1 commenced with an inaugural session graced by Prof. Avinash Chandra Pandey, Director, IUAC, New Delhi; Dr. O. P. Chaurasia, Director, DIHAR-DRDO, Leh; Dr. Mohana Krishna Reddy Mudiam, Director, IPFT, Gurugram; Prof. Talat Ahmad, Chairman, Wadia Institute of Himalayan Geology, Dehradun; Prof. S.K. Mehta, Vice Chancellor, University of Ladakh and Dr. Riyaz M.K.Khan, Convenor of the Workshop.

Prof. S.K. Mehta, Hon’ble Vice Chancellor, University of Ladakh, set the tone with the welcome address, expounding on the rapid advancement of instrumentation in the field of science and technology. He further spoke that to carry out quality research, one needs to know about advanced technology. He presented a brief outline of the progress of the university and the newly established instrumentation Centre.

Prof. Talat Ahmad spoke of his deep love for the University of Ladakh, where the seeds of progress he planted during his tenure as Vice Chancellor of Kashmir have blossomed beyond measure. He highlighted the significance of having a university in the remote region of the Himalayas and emphasized the impact of cutting-edge scientific instruments on the R & D in Leh, Ladakh.

Dr. O.P. Chaurasia commended the University of Ladakh for establishing a high-end instrumentation facility. Such a facility was very much needed in this region since long. Young scientists here will have the opportunity to use such instruments.

Dr. Mohana Krishna Reddy Mudiam showered all the praise for the university and foresaw the University’s pivotal role in nurturing a robust research culture in the region.

Prof. Avinash Pandey, the Chief Guest on the occasion, very enthusiastically spoke about the importance of new technologies and their pivotal role. He stressed the importance of scientific data and
interpretational skills for high-quality research output. He offered valuable insights into governance associated with scientific interpretation. He also emphasised that the latest technological advances can be used for the betterment of society and congratulated University of Ladakh for establishing a state-of-the-art instrumentation facility in a short span of time.

Dr. Riyaz M.K. Khan extended a gracious vote of thanks, acknowledging the contributions of all dignitaries and participants to the success of the inaugural function. This was followed by a technical session featuring two presentations and lab visits for a live hands-on experience on the instruments.

**During Technical Session-1.** Dr. Komal Jain, Application Scientist at Anton Paar, conducted a session on “X-ray Diffraction: A powerful tool for structural analysis”, and provided insights into the working principles, various applications of XRD instrument in industrial and scientific research enhancing participants’ understanding and expertise.

Mr. Chandra Rajwar, Product Specialist at Agilent (Spectroscopy) spoke about the “Latest Trends in Elemental Spectroscopy Technologies”, providing an insight into the principle, applications and emerging trends of various spectroscopic techniques used across different industries.

The Technical Session was followed by practical demonstrations on the working of ICP-MS and XRD conducted by Mr. Ashish Kapoor and Dr. Komal Jain, enriching the learning experience for participants.

**On Day-2,** Dr. Aashima Sharma, a distinguished Research Associate from PGI MER conducted a Technical Session on “Electrochemistry Unveiled: Exploring Fundamental and Its Applications.” Dr. Sharma delved deep into the fundamental aspects of electrochemistry and its diverse applications across various fields. Following this, there was a live demonstration of the Multichannel Electrochemical Workstation at the Centralized Interdisciplinary Science Instrumentation Centre (CISIC), University of Ladakh, facilitated by Dr. Aashima Sharma herself. This hands-on experience provided invaluable insights into the practical aspects of electrochemical analysis, generating significant interest and participation from attendees.

Dr. Rekha Bhar, an Application Specialist from Anton Paar, delivered an interesting talk on “Adsorption Dynamic: A Focus on Physisorption.” Dr. Bhar’s expertise captivated the audience, offering them a comprehensive understanding of adsorption dynamics and its implications across various applications such as gas adsorption, catalysis, separation processes and, drug delivery systems. She emphasized the crucial role of physisorption in determining surface area, pore size distribution, and surface energetics of materials, underscoring its significance in scientific research and applications.

At the Valedictory function, Dr. Sonam Joldan, Dean of Academic Affairs, University of Ladakh, extended a vote of thanks. The Chief Guest, Dr. Neena Mehta, Dean of Academics, Rayat Bahra Dental College and Hospital, commended the University’s initiative in organizing such an insightful Workshop and stressed the importance of cutting-edge scientific instruments in academia and research.

Referring to her own academic journey, she emphasized the enduring affection she has for the University of Ladakh, recognizing the significance of fostering collaboration between academia and industry for scientific advancement.

The event concluded with the rendition of the National Anthem. The participants showed a high inclination to adopt research as their career and contribute towards Viksit Bharat@2047. The National Workshop on Cutting-Edge Scientific Instruments and Training provided the participants with a unique opportunity to enhance their research capabilities, network with peers and gain practical experience in operating advanced instrumentation. The Workshop has laid the foundation for future advancements in scientific research and innovation in the Leh-Ladakh region. Moving forward, continued investment in training and infrastructure will be essential to sustain and accelerate the Vision and Goals of CISIC for advanced research in the Trans-Himalayan Institute of Higher Learning and Research in Ladakh Region.

**Acknowledgments:** The authors would like to thank the organizers, speakers, and participants of the workshop for their contributions and engagement, which made the event a resounding success. Special thanks to DST for providing PURSE grant for establishing high-end instrumentation facility at the University of Ladakh. RMKK is also thankful to DST for granting MRDP Project (DST/CCP/NMSHE/ MRDP/207/2021, dated 16/05/2023). Dr V N Vasudev is thanked for kindly reviewing the manuscript and suggestions for its improvement.