NEWS AND NOTES

E-workshop on 'Luminescence Dating Technique and New Applications': A Report – Anil Kumar* and Pinkey Bisht, Wadia Institute of Himalayan Geology, Dehradun. (*Email: akumar@wihg.res.in*; pinkybisht@wihg.res.in*)

The luminescence dating technique has grown substantially and accepted globally as a prime chronologic method for the estimation of the age of sediment (that are few hundred years to ~500 thousand years) of the Quaternary time. Fundamentally, this technique encompasses sampling strategy, luminescence physics and statistical data analysis. New development in the automated tools and protocols has enlarged the scope of this method and increased the dating limitations and applications. Any smallest discrepancy at any stage may lead to erroneous results and wrong interpretation. Therefore, to keep in pace with the global scientific trends in luminescence dating technique and to keep all new-comers well informed, it was essential to organize the workshops where resource persons can be brought under a single platform and discuss the new developments, new tools and new statistical methods.

Therefore, luminescence dating community in India i.e. Indian Association of Luminescence Dating (IALD), meets annually to update the upcoming generation of students and young scientists about the recent advancement in the Optically Stimulated Luminescence (OSL) dating technique. In this sequence, Wadia Institute of Himalayan Geology, Dehradun (WIHG) under the umbrella of DST Golden Jubilee celebrations successfully organized 3rd workshop on "Luminescence dating technique and new applications" from 25th-27th November 2020. The workshop was convened by Dr Anil Kumar and Dr Pinkey Bisht. More than 300 participants registered and got benefits from this e-workshop.

This three days e-workshop focused on the (i) newer application of Luminescence dating in Earth sciences; (ii) imparting training on the statistical methods/techniques leading to improvement of the age models. The workshop was divided into three sessions that covered 13 lectures from the resource persons from India as well as the internationally renowned laboratories. The workshop was introduced to participants by Dr Pradeep Srivastava (Scientist, WIHG) and then an address by Prof. Kalachand Sain, Director, WIHG and an inaugural lecture was delivered by Prof. Ashok K Singhvi, DST, Vice President, INSA, New Delhi. Prof. Singhvi discussed different new variants of luminescence dating technique and their applicability and he further stressed on the need of formation of national working groups focusing on development new applications of the technique.

Session-1 on 'Applications in luminescence dating' had two lectures from Dr Mayank Jain (DTU, Denmark) and Dr Harrison Gray (Luminescence Chronology Lab, USGS, USA). Dr Jain and Dr Gray discussed luminescence as new tool with applications on rock surface exposure dating. Their lectures focussed on the (i) development of high temperature post IRIR method, and rock luminescence dating (ii) depth profiling in the gravel and surface rock at the millimeter scale providing an age control of gravelly deposits and in developing the low temperature thermochronology and associated erosion rates. The session -2, 'Development in OSL in India' was dedicated to the new development in OSL dating in India. In this session, 9 lectures were presented by various speakers namely: Dr Manoj K. Jaiswal (IISER, Kolkata), Dr Morthekai P. (BSIP, Lucknow), Dr Naveen Chauhan (PRL, Ahmedabad), Dr Devender Kumar (NGRI, Hyderabad), Dr Madhav K Murari (IUAC, New Delhi), Dr Anil Kumar (WIHG, Dehradun), Sh. Sharat Dutta (GSI, Faridabad), Dr Siddharth Prizomwala (ISR, Gandhinagar). Dr Morthekai, Dr Murari and Dr Chauhan discussed the luminescence dosimetry, bleaching with moonlight, comparison of quartz and feldspar ages, aliquots size dependent ages and related bleaching heterogeneity. Dr Chauhan also discussed the use of Violet Stimulated Luminescence (VSL) with 3.06eV energy at 405 nm to extend the dating limits of the luminescence dating. Lectures from other labs showcased application of OSL dating as a dating tool. Dr Rabiul H Biswas (Institute of Earth Surface Dynamics, University of Laussane, Switzerland) showcased the use of luminescence in extracting the rock exhumation related information through modelling. Dr Nathan D Brown (U.C., Berkeley, USA) demonstrated the luminescence as a proxy of geomorphologic processes. Dr Brown discussed grain transportation, wild-fire history, bedrock temperatures and cooling rates, soil mixing rates through bleaching and re-accumulation of luminescence signals. The session -3 "Student interaction and Panel Discussion" had two sections: (1) a student interaction session, where three research scholars Dr Biraj Borgohain (IIT-Bombay), Dr Poonam Chahal (WIHG) and Ms Kartika Goswami (IISER-Kolkata) shared their experiences while they completed their Ph.Ds involving the technique (2) a panel discussion session, which was dedicated to discussing the issues in luminescence chronology, global, development and gaps in Indian laboratory. This session was moderated by Dr Pradeep Srivastava with summary given by Prof. Singhvi. The major outcome of this discussion was (1) there must be large scale projects where geologists, luminescence physicists and mathematicians should collaborate and work together, (2) organization of a workshop on mathematical geology is needed to encourage mathematical modelling in the geosciences, (3) monthly colloquium on luminescence should be organized, (4) inter-laboratory comparison and standards for dosimetry should be done every year. The meeting ended with vote of thanks proposed by Dr Suresh N and that the next workshop will be held at IISER-Kolkata.

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