

# Bose Colloquium

**S. N. Bose National Centre for Basic Sciences**  
(An Autonomous Research Institute established under DST, GOI)



## Title:

**Climate-induced Geo-hazards in the Himalaya and Plausible Mitigation**

## Abstract:

The mighty Himalaya is the World's youngest and most rugged mountain chain, which has been formed by collision tectonics at early Eocene age. The glaciers, snow fields, rivers and sediment-water transports have made the Himalaya as the center for habitation and socio-agro-economic development and cultural growth. But the Himalaya is stressed by several subsurface and surface processes such as the crustal shortening, complex geodynamics, convergence, tectonics/neo-tectonics, rock deformation, rising/exhumation, weathering, erosion, solid/liquid precipitation, elevation-dependent warming, etc. The vulnerability due to these stresses have been further aggravated by the climate-induced extreme events and anthropogenic activities. The processes are still going on and have changed the landscapes and geomorphology of the Himalaya, which, in turn, control the damage pattern during a catastrophe, and the people living in the Himalayan states are under threat or risks due to geo-hazards of different magnitudes. Every year, people in the mountainous region experience some sort of disasters that incur huge economic loss in terms of death toll and damage to properties and structures. As per PM's 10 points agenda on Disaster Risk Reduction, it is our responsibility to build a disaster-resilient and climate-adaptable future for sustainability and secured living in the Himalaya and adjoining regions.

All these tragic events, influenced by the natural processes cannot be stopped but their impact to lives and livestock and damage to properties and structures can be reduced by developing an alert system through establishing a network of multiple stations of different kind in the field, real-time transmission of data to a centralized monitoring center, processing/analysis and integration of data, developing an warning system followed by alerting against such disasters. With the dense network of stations, availability of fast computing system, advancement of modelling approaches, integration of data using AI/ML, it is possible to achieve the goal of developing an integrated warning system (IWS). The investment on this monitoring and development of IWS would be much more cost-effective than the cost we have to pay for the rehabilitation, restructuring, and loss of lives. Once the IWS becomes operational at a basin or in an area, it can be easily developed and deployed to other areas of concern. A few aspects of climate-induced Geo-hazards in the Himalaya such as the glacial/snow avalanches, landslides, flash floods, and their plausible mitigation would be presented.

## Speaker:

**Prof. Kalachand Sain**

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Professor Kalachand Sain has obtained his M.Sc. (Tech) in Applied Geophysics from IIT-ISM, Dhanbad and Ph.D. in Active Seismology from CSIR-NGRI (Osmania University), Hyderabad. He visited Cambridge University (UK) and Rice University (USA) as a postdoctoral Fellow, and USGS (USA) as a Visiting Scientist. He is presently the Director of the Wadia Institute of Himalayan Geology (An Autonomous Institute of DST, GoI), Dehradun. Earlier, he was the Chief Scientist & Head of the Seismic Group at CSIR-NGRI. He is also an honorary Outstanding Professor at AcSIR of CSIR. He is a fellow of INSA, IAS, NASI etc. and has been honoured with many National Awards.



**30 January, 2023**



**4.00 PM**  
**at Silver Jubilee Hall**



**Webinar Link**

**YouTube YouTube Link**

