

3-Week Capacity Building Program in Glaciology

4th-23rd September, 2023

Organised
by
University of Kashmir
Srinagar, India



Sponsored by



Department of Science and
Technology DST, GoI
Under Climate Change Program

About the Capacity Building Program

We recognize the paramount importance of glaciers in the Himalayas, which not only provide freshwater for drinking, agriculture, and hydropower generation but also contribute significantly to the ecological balance of the region. As the effects of climate change continue to unfold, it is crucial to build the capacity of Indian researchers so that they are able to undertake interdisciplinary glaciological research endeavors to understand the dynamics of glaciers and their response to climate change. By studying glacier mass balance, glacier dynamics in term of glacier velocity, thickness, and equilibrium line altitude, we can unravel the complex interactions between glaciers and the changing climate. Furthermore, we need to investigate the implications of glacier melt on various resources and economic sectors in the Indian Himalaya. Capacity building has therefore become a prerequisite to foster extensive research on glaciers and facilitate adaptation strategies to address these issues.

In recognition of the above, the University of Kashmir under the aegis of the Centre of Excellence for Glacial Studies in the Western Himalaya are conducting a 3-week capacity building program with the support of the Department of Science and Technology, Govt. of India. Through the capacity building program, we intend to build the capacity of the school participants in theoretical aspects of glaciology, cutting-edge research methodologies, use of the state-of-the-art facilities and instruments, glacier field training, involving a high-class expertise and well-trained team of field glaciologists. It is hoped that the capacity building program shall help the school participants to unravel the complexities of glaciology, glacial-hydrology and climate change influences.

The capacity building program aims at enhancing the human and institutional capacities of Indian students and researchers on various aspects of glaciology and allied fields and shall equip them with necessary knowledge and skills to carry out their research independently. The program is starting in September 2023 and shall continue for three years (2023-26).

Course Eligibility

The capacity building program is open to physically and psychologically sound graduate students throughout India targeting primarily early stage PhD students researching cryosphere and related fields. Students must be enrolled in a PhD during the time of the capacity building program. Women participants are particularly encouraged to apply for the school and shall be given preference, if, otherwise eligible. However, first-year postdocs/early-career scientists and bright Master's students may also be considered in exceptional cases, if a strong case can be made about why this course is useful to the applicant. Prior knowledge/background in glaciology and allied fields is a prerequisite. Participants need to submit a commendation letter from the Head/Director of their institution along with the application form. 2nd AC train travel and hostel accommodation shall be provided to all the School participants.

Important Dates

- Online registration : 10 July, 2023
- Last date of registration : 10 Aug, 2023
- Selection List : 15 August, 2023
- Course starting : 01 September, 2023
- Registration Link: [Click here](https://forms.gle/MntAi588JhcPAAfZ7)

<https://forms.gle/MntAi588JhcPAAfZ7>

Resource persons/Course Instructors

Leading experts in the field of glaciology, glacio-geomorphology, glacier-hydrology, climate change and allied fields from various institutes of national and international repute will act as resource person for lecturing on theoretical and field aspects of glaciology and allied fields. Furthermore, well-trained glacier scientists and field glaciologists will be engaged as course instructors for practical and fieldwork to equip the participants with the necessary field knowledge to build their capacity in various aspects of field glaciology and instrumentation use.

Course Structure



Date	Day	Activity
03-Sept.	0	Arrival at Srinagar, Kashmir and Guest House check-in. Free evening
04-Sept.	1	Inauguration and overview of the Glacier Capacity Building program Fundamentals of Glaciology and introduction to important related fields Glacier monitoring and assessment approaches Remote sensing of cryosphere; inventory and glacier parameter retrieval
05-Sept.	2	Glacier mass balance approaches Glacier thickness and volume estimation Glacier modelling Advanced instrumentation for glacier studies
06-Sept.	3	Paleo-glaciation in the Himalaya Glaciers under changing Climate Climate Models: Scenarios, downscaling, and projections Aerosol-glacier interactions
07-Sept.	4	Glacier dynamics: ice velocity and surging Glacier geomorphology and glacier terrain mapping LGM, dating and paleo-glacier reconstructions
08-Sept.	5	Glacier hydrology: Snow melt runoff modeling, Isotope hydrology and tracers Glacier Hazards: GLOFs Mini Project (2-3 students): Group and topic assignment
09-10, Sept.	6 & 7	Holiday
11-13 Sept. 13-Sept (AN)	8 to 10	Mini Project (2-3 students) Glacier Fieldwork orientation, safety considerations, logistics and instrumentation
14-Sept (FN) 14-22 Sept.	11 to 19	Departure to Ladakh for fieldwork at the Machoi glacier Field training at the glacier site
22-Sept (AB) 23-Sept.	20	Departure to KU, Srinagar Student project presentation & Valedictory Function
24-Sept.	21	Departure of the School participants to respective destinations

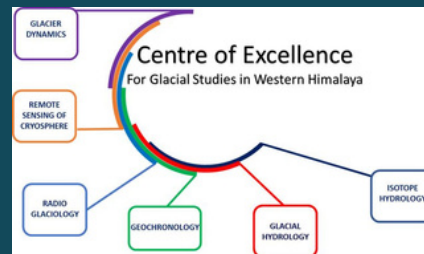


Centre of Excellence for Glacial Studies



The Centre of Excellence for Glacial Studies in the western Himalaya is an inter disciplinary research effort involving researchers cutting across various domains of Cryosphere, Hydrology and Climate change established at the University of Kashmir with partnership from the relevant institutes within and outside the region. The initiative was launched with the support of the Department of Science and Technology (DST), Govt. of India as part of the National Mission for Sustaining the Himalayan Ecosystem (NMSHE) in March, 2020. The Himalayan region is highly prone to the climate change due to its ecological fragility, biophysical setting and geographic location. The vast snow and glacier resources, trans-boundary river basins, and inherent socio-economic instabilities are some of the factors that make it important to study the climate change impacts in the Himalaya. The concern over the depletion of the cryosphere in the Himalayan region has attracted the attention of the scientists, decision makers, and policymakers to understand the dynamics and driving factors of Himalayan cryosphere. In order to provide a flip to the glaciological research activities, it was therefore thought necessary to establish a Centre for Excellence (CoE) for Glacial Studies at the University of Kashmir.

CoE thrust research areas



CoE research team

• Prof. Shakil A. Romshoo	PI
• Dr. Reyaz A. Dar	Co-PI
• Dr. Sarah Qazi	Co-PI
• Dr. Khalid Omar	Co-PI
• Principal Project Associate	1
• Senior Project Associate	3
• Project Associate - II	3
• Project Associate - I	4
• Sc/Lab/Tech Assistant	3
• Field Worker	2
• Total Technical Staff	21



<http://ncrl.uok.edu.in/Main/Default.aspx>



Lab/Field Instrumentation

The CoE has state-of-art Lab. and field instrumentation including:

- Unmanned aerial vehicle
- Terrestrial laser scanner
- Total organic carbon analyser
- Spectro-Radiometer
- Isotope analyser
- Steam driven ice drill
- Ice radar
- Ice core drill
- Aethalometer
- Ice-core Laboratory



ToC Analyser



Spectro-radiometer



Terrestrial laser scanner



Ice-core Laboratory



Isotope Analyser



Heuckes Drill



Ice core drill



Unmanned Aerial Vehicle



Ice core freezer



Ice Radar



GPR profiling

Glacier field work



Machoi Glacier

Machoi glacier located in the Ladakh region has been chosen for imparting field training on various aspects of glaciology and instrumentation use to the school participants. The glacier is about 6 Sq. km in area and is situated in the Drass sub-basin, about 26 km from Sonamarg, the major tourist attraction in the Kashmir valley. The Drass River originating from the melt-waters of the Machoi Glacier joins the Suru River at the Kargil town. The Glacier, facing north, has a mean altitude of ~4600 m asl and the slope ranges from 1° – 60° with a mean value of 21°. The glacier is being monitored by the University of Kashmir since 2013 for various aspects including length and area changes, mass balance, ice thickness using state-of-art instrumentation and earth observation data.



Ice core drilling at Machoi

Accommodation

University Guest House in the main campus University of Kashmir which is situated at Hazratbal, Srinagar. It is flanked by the world famous Dal Lake on its eastern side and Nigeen Lake on the western side. The Main Campus of the University spread over 247 acres of land is divided into three parts – Hazratbal Campus, Naseem Bagh Campus and Mirza Bagh Campus (serving residential purpose). The tranquil ambience of the Campus provides the right kind of atmosphere for serious study and research. The participants in the program will be accommodated in Guest house during the theoretical part of the program. However, during field work at the Machoi glacier, the participants will be accommodated on sharing-basis in nearby hotels in Drass for a few days and also in the tents pitched at the base camp of the Machoi glacier or in the vicinity.



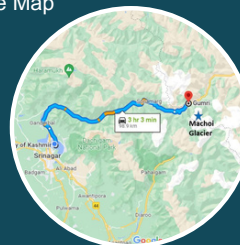
KU, Guest House



Machoi Base Camp



Airport-TRC to KU



KU to Machoi Glacier



Contact Us

- **Prof. Shakil A. Romshoo**, PI CoE
Professor Geoniformatics
- **Dr. Reyaz A.Dar**, Co-PI CoE
Assistant Professor, Earth Sciences
- **Dr. Khalid Omar**, Co-PI CoE
Faculty, Geoniformatics
Phone: +91-7006482139
✉ komurtaza@gmail.com
- **Dr. Tariq Abdullah**, Co-Coordinator
Senior Project Associate, CoE
Phone: +91-7889549043
✉ tariqabkhan@gmail.com