जल शक्ति मंत्रालय
जल संसाधन, नदी विकास और गंगा संरक्षण विभाग
MINISTRY OF JAL SHAKTI
DEPARTMENT OF WATER RESOURCES,
RIVER DEVELOPMENT & GANGA REJUVENATION

1st National HimSchool

on

'Cryosphere & Climate Change Studies'

(NHC3S-1: 2025)

March 24-28, 2025

--- For Postgraduate & PhD Students and Young Professionals ---

Organized by

Centre for Cryosphere & Climate Change Studies (C4S)

National Institute of Hydrology

(A society under Department of Water Resources, River Development and Ganga Rejuvenation, Ministry of Jal Shakti, Govt. of India)

Roorkee – 247 667, Uttarakhand, India

www.nihroorkee.gov.in

Motivation

Glaciers are vital, perennial sources of freshwater, playing a critical role in replenishing rivers through their meltwater. In the Hindu-Kush-Himalaya region, often referred to as the "Third Pole," approximately 54,000 glaciers span an area of about 60,000 km^2. Despite their immense significance, only a limited number of these glaciers have been extensively studied for glacio-hydro-meteorology, energy-mass balance, geometric changes, snout fluctuations, snow cover variations, debris-cover dynamics, paleo-glacial records, and meltwater chemistry, establishing them as 'benchmark glaciers' for scientific investigation.

With the accelerating impacts of climate change, the Himalayan glacier system has garnered significant attention from the scientific community. This system is an integral part of water security for approximately 1.8 billion people across South Asia, either directly or indirectly, underscoring the critical importance of its study. Addressing the complex challenges posed by a changing climate requires a cadre of well-trained researchers specializing in Cryosphere and Climate Change studies.

NHC3S-1: 2025 initiative aims to introduce participants to the fundamentals of Cryosphere and Climate Change research, providing a comprehensive overview of specialized topics and the latest research frontiers. Participants will engage with leading experts, delve into cutting-edge research areas, and prepare for long-term, multi-year research initiatives at both national and international levels. The primary objectives of the program are to:

(i) Train a new generation of researchers in Cryosphere and Climate Change studies

(ii) Promote interaction and foster networking among participants.

Course Contents

The course will be conducted by organizing - (a) Interactive technical sessions & talks, (b) hands-on Instrumentation and laboratory visits, and (c) Possible scientific solutions for Cryo-Climate related issues.

Theory Module: Himalayan Glacier and Snow Cover, Glacio-hydro-meteorology, Glacier energy-mass balance measurements, Cryo-hazards, Stable Water Isotopes, Weather and Climate Modelling, Impact of Aerosols over Cryosphere, Himalayan Springshed Management, Himalayan Case Studies, Challenges identified for Himalayan Communities due to melting glaciers and adaptation Plan/ Practices.

Hands-on Training Module: Glacio-hydrological modelling, Application of Remote Sensing & GIS, Glacier Lake outburst Floods (GLoFs), Cryo-climate data Mining, Role of Google Earth Engine in Cryo-climate studies, Basics of R & Python Programming, Instrumentation.

Laboratory visits: Hydrological Instrument, Nuclear Hydrology, Remote Sensing & GIS, Hydromet Observatory, Soil & Water, Water Quality

Who should Attend?

Enthusiastic Postgraduate/early-stage PhD students and Research Fellows from Central/State Government Organizations/Institutes/Recognized Universities and Young Professionals (< 35 years) having keen interest and working in the area of Cryosphere and Climate Change studies are eligible to apply for the NHC3S-1: 2025. The school can accommodate 25 participants.

'Eligible female candidates are strongly encouraged to apply for the school as per the promotion policies of the Institute & Govt. of India'

Faculty Members

Surjeet Singh (Sc. 'G' & Head)	- Ground Water Modelling, River Hydrology, Hydrochemistry
Soban S. Rawat (Sc. 'F')	- Mountainous Hydrology, Spring shed Management
Ashwini A. Ranade (Sc. 'D')	- Asia-pacific Monsoon, Global climatic changes
Sunil Gurrapu (Sc. 'D')	- Hydrological Extremes, Climate change
Vishal Singh (Sc. 'D')	- Snowmelt and Glacier melt Runoff Modelling, RS & GIS
Lavkush K. Patel (Sc. 'D')	- Glaciology, Glacio-Hydrological modelling, RS & GIS
Kapil Kesarwani (Sc. 'D')	- Cryospheric, Atmospheric and Environmental Sciences
Deepak S. Bisht (Sc. 'C')	- Hydrological Modelling, Climate Change, RS & GIS, Springs
Akshaya Verma (Sc. 'C')	- Glacier dynamics, Stable Water Isotopes, Glacier-hazards
Kuldeep Sharma (Sc. 'C')	- Weather and Climate Modelling, Ensemble Prediction
Riyaz Mir (Sc. 'C')	- Glaciology, Hydro-Geo-Chemistry, RS & GIS
Rajat Kumar (Sc. 'B')	- Climate change, Hydrological modelling
Jatin Malhotra (Sc. 'B')	- Snow & Glacier, Hydrometeorology, RS & GIS
Sachchidanand Singh (Sc. 'B')	- Water Quality, Flood Management, RS & GIS
Siddharth Arora (Sc. 'B')	- Hydrological Modelling, Isotope Hydrology, RS & GIS

Important Dates

School Dates	: March 24-28, 2025 (05 days)
Last Day for Registration	: March 05, 2025
Confirmation to Selected Participants	: March 10, 2025

Registration Process (Online)

Applicants are advised to fill the application form online using following link -

https://forms.gle/yZCRfh9QfSrHedhS6

Registration Information

Category	Early-Bird Registration (Feb. 01-21, 2025)	Late Registration (Feb. 22-Mar. 05, 2025)
Postgraduate Student	₹ 4,000	₹ 5,000
PhD Student/Research Fellow	₹ 5,000	₹ 7,000
Young Professional	₹ 7,000	₹ 10,000

Registration fees include - Course materials & kit, working tea, and main meals during the course of the event.

Payment Methods (NEFT/IMPS)

Name of Beneficiary	: NIH Project
Bank Details	: Punjab National Bank (Branch: IIT Roorkee branch)
Account Number / IFSC	: 4044000100174852 / PUNB0404400

For Outstation Applicants

Institute's Sindhu Guest House has limited number of accommodation facilities, which can be arranged on a sharing and payment basis for the applicants. Allocations will be made on a first-come, first-served basis.

Patron

Dr. Manmohan Kumar Goel
Director, NIHR

Coordinator

Dr. Surjeet Singh
Scientist 'G' & Head: C4S, NIHR

Convenors

Dr. Kapil Kesarwani
Scientist 'D', C4S, NIHR

Dr. Akshaya Verma
Scientist 'C', C4S, NIHR

Co-Convenors

Dr. Vishal Singh
Scientist 'D', C4S, NIHR

Dr. Lavkush K. Patel
Scientist 'D', C4S, NIHR

Dr. Kuldeep Sharma
Scientist 'C, C4S, NIHR

Organizing Secretaries

Rajat Kumar
Scientist 'B', C4S, NIHR

Jatin Malhotra
Scientist 'B', C4S, NIHR

Arushi Sharma
JRF, C4S, NIHR

Venue

Centre for Cryosphere & Climate Change Studies (C4S)
National Institute of Hydrology
Roorkee – 247 667, Uttarakhand, India
https://nihroorkee.gov.in/scientific-divisions/climatehydrologydivision/about-division

Roorkee city (Uttarakhand) is around 187 km from Delhi and is well connected to the other cities of North India by Rail, Road, and Air (Dehradun Jolly Grant Airport). To reach the NIH Roorkee, public transports are available from Roorkee bus stand and Railway Station.

The average temperature in Roorkee in March for a typical day range from a high of 30°C to a low of 14°C. There is a slight chance of rain during this month.

Location Coordinates : 29.8685° N, 77.8942° E
Google Map Link : https://maps.app.goo.gl/b3g2j8VpnP445fbKA

Standard Guidelines

- ✓ Due to the limited infrastructure facilities at the Institute, selected participants are strongly encouraged to bring their personal laptops to attend the Hands-on Training Modules.
- ✓ To ensure a safe and conducive learning environment, all participants and staff involved in the program are required to adhere to the established Code of Conduct and Ethics.

We look forward to welcoming you at Roorkee in March 2025...!!

For queries

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National Institute of Hydrology, Roorkee

National Institute of Hydrology (NIH) is a premier Research and Development organization under the Ministry of Jal Shakti, Department of Water Resources, River Development and Ganga Rejuvenation, Government of India. It was established as an autonomous society in 1978 with its headquarters at Roorkee. The main objectives of NIH are to undertake, aid, promote and coordinate systematic and scientific work in all aspects of hydrology. The Institute was declared as an Science & Technology organization in 1987.

Centre for Cryosphere & Climate Change Studies (C4S)

To address the challenges posed by climate change to water resources requires multi-facet approaches. The vision behind the Centre for Cryosphere and Climate Change Studies (C4S) is to develop advance scientific knowledge and understanding of the complex interactions between climate and the hydrological cycle. The Centre aims to contribute to the development of sustainable water resource management practices, adaptation strategies, and policies in the face of climate change.

The Centre is carrying out climate change as well as experimental studies in the Himalayan region (Gangotri Glacier, Milam Glacier, and Triloki Glacier) involving establishment of state-of-art hydrological field observatories with advanced automated instrumentation such as Automatic Weather Station, Automatic Water Level Recorder, etc. Though the Centre is in nascent stage but is carrying out extensive works in the field of snow and glacier contribution and impact of climate change on snow and glacier, glacial lake outburst flood and mass balance, and spring shed management. Application of various models, viz. SNOWMOD, SPHY and VIC, is being done for various hydrologic analysis using remote sensing data and GIS tools. The Centre is also participating in the National Hydrology Project (NHP), DST, IIRS, National Mission for Sustaining the Himalayan Eco-system (NMSHE) and National Mission on Himalayan Studies (NMHS) projects. Furthermore, the centre is also extending the support as technical lead in first census of springs in India. The Centre is actively involved in developing web-based portals for water resource information.