Fourth Circular

7th National Geo-Research Scholars Meet on Geosciences: Emerging Methods

September 12-14, 2023

at

WADIA INSTITUTE OF HIMALAYAN GEOLOGY
(An Autonomous Institute of Dept. of Sci. & Tech., Govt. of India)
33, General Mahadev Singh Road
Dehradun - 248001 (Uttarakhand)

NGRSM

The National Geo Research Scholar Meet (NGRSM) started in 2016 as a scheduled event of Wadia Institute of Himalayan Geology to encourage young researchers and students for improving their research interests, providing them a platform to share their research work, field exposures, receive feedback from the peers and refining their research. The event also allows them to interact with eminent geoscientists and understand the latest trends in Geoscientific research. Previously, the 6th NGRSM was held at Leh, Ladakh and was focussed on the field geology of the India-Asia collision zone of Ladakh. The 7th NGRSM 2023 meeting is to motivate the young researchers about the Geosciences: Emerging Methods (GEM) to understand the geodynamics and the processes of mountain building through advanced insight into the geo-analytical tools and applications of artificial intelligence and machine learning in Earth sciences.

Technical Program: (i) Inaugural Session; (ii) Keynote Lectures; (iii) Contributory Talks; (iv) Posters; (v) Field Visits; and (vi) Concluding Session.

A. Subthemes of the Conference

1. Geodynamics & Mountain Building Processes

Mountain belts are the manifestation of the Earth's dynamism that grow through the interplay of internal tectonism and external climatic agents. The formation of these belts incorporate rifting and collisional process, subduction and magmatism, crustal deformation and metamorphism, exhumation and erosion. These processes on the Earth are ongoing since its formations which can be envisaged through the record of various supercontinental cycles. Thus, a complete understating of the formation of any mountain belt and Earth's processes require multi-scale inter-disciplinary studies from millennial, kilo-, centennial- and decadal scales. This multidimensional knowledge forms the basis to understand the causes of natural hazards and hence provide clues for their mitigation. Thus, this sub-theme will cover multiple sessions with following topics:

- *Crustal Deformation and Metamorphism*
- *Magmatism and Mineralization*
- *Basin Evolution and Paleoecology*
- *Climate and Tectonics*

2. Sophisticated Geoanalytical Tools

The modern era of geosciences is based on the quantitative data analysis, analogue, statistical and numerical modelling to understand the heterogeneities of dynamic Earth. Such analyses require high-end analytical facilities and robust data-generation that depends on continuous research and development of the techniques. These may include geochemical, geochronological, structural, sedimentological, remote sensing, paleontological, paleoclimate, thermochronology and geophysical data to understand various Earth's problems. The purpose of such data generation is to discover various processes of the Earth and validation of these processes using statistical tools. Thus, this sub-theme will be focused on the application of analytical techniques following topics:

- *Geochemical and Geochronological Methods*
- *Thermochronological Methods*
- *Geophysical Tools*
- *Geospatial Techniques*

3. Artificial Intelligence in Geosciences

The human brain is an expert system in analyzing patterns or, putting it in another way human intelligence is quick in demonstrating its proficiency for making qualitative analysis. However, very often the brain becomes exhausted in delivering accurate answers to quantitative questions. If a machine (e.g., a calculator or a computer) on the other hand is programmed to do such jobs, quantitative solutions could be rapidly and easily achieved. A machine can work continuously and deliver such solutions with great accuracy. When these machines are trained to work under the guidance of human intelligence, optimum solutions to large and complex problems can be achieved with much ease. This motivates to amalgamate human intelligence with machine intelligence. Machine learning is a subfield of Artificial Intelligence that enables machines to automatically learn and improve from the available large chunk of data sets. Geoscientific data are such kinds of data sets, which are non-linear and need technological advancements for flawless interpretation and analysis. Machine learning in this regard possesses a great proficiency to automatize the process of interpreting geoscientific data with much reduced human intervention. This sub-theme aims to highlight the importance of machine learning practices in analyzing and interpreting large non-linear geoscientific data. The following topics shall be covered under this sub-theme:

- *Machine Learning Practices in Geosciences*
- *Geo-hazards and Mitigation*

B. Field Visit: Himalayan Frontal Thrust to Main Boundary Thrust

One day post-conference field visit will be arranged for the interested participants on September 14, 2023 by the organizers.

C. Abstract Submission

The Organizing Committee invites young researchers to participate and submit abstracts to the 7th NGRSM. An abstract containing not more than 500 words is to be submitted through e-mail: ngrsm2023@gmail.com latest by August 26, 2023; MS Word Times New Roman format with 12pt font and 1.5-line spacing. The abstract should include the title, name (s) of the author(s), organization, and presenting author's e-mail. The abstract template can be downloaded from http://www.wihg.res.in

D. Presentation

Poster: Space in a A0 size hardboard will be available to present the poster on the prescribed theme.
There will be a two minute oral presentation by the candidate in for each session. Detailed discussions will be during the poster session.

E. Registration and Selection Criteria

Young researchers working in any field of Geosciences can apply in the given registration form and send their registration form through e-mail: ngrsm2023@gmail.com by August 26, 2023.
There is no registration fee for the participants. Research scholars with a minimum of one year of research experience will be given preference. However, newly joined research scholars with interesting findings may also apply.

Registration Form
7th National Geo-Research Scholars Meet
(September 12-13, 2023)
at
Wadia Institute of Himalayan Geology, Dehradun-248001

1. Applicant Name:.....

2. Father's Name: .....

3. Date of birth (dd/mm/yyyy): .....

4. Gender:.....

5. Corresponding address:.....

6. E-mail id and contact no:.....

7. Name of Theme:.....

8. Academic qualifications:.....
M.Sc. / M.Tech. / Ph.D. /P.D.F.

9. Research experience (yy, mm):.....

10. Research papers:.....

11. Host Institution / University:.....

12. Supervisor / HOD:.....

a. Name :.....
b. E-Mail ID: .....
c. Contact No: .....

13. A brief outline of present research activity with future prospects (max. 200 words):.....

14. A brief note on "How will you be benefitted by this meet":.....

15. Have you attended the earlier National Geo-Research Scholar Meet (NGRSM):……

16. Will you attend the post-conference field trip:……

Date: Signature of the applicant

Place:

Signature of Head of Department/ Institution
(with office seal)

F. Accomodation
Stay at Dehradun during the conference will be provided by the organizers.

G. Travel
Train (AC III-tier fare) to & fro upto Dehradun from workplace/hometown will be reimbursed to the selected participants.

H. Awards
Prof. D. N. Wadia's best poster presentation award will be given to participants.

WIHG the Host

The **Wadia Institute of Himalayan Geology (WIHG),** located in Doon valley, is a premier institute pursuing both basic and applied researches in geosciences to unravel the orogeny of majestic Himalaya and provide an improved understanding on seismogenesis, geodynamics, climate-tectonic interactions, biotic evolution and extinction, glacial dynamics, river system, geo-hazards (landslides, floods, and earthquakes), natural resources (geothermal, minerals/ores, hydrocarbons, springs), anthropogenic impact, etc. towards the well-being of the population and safeguarding the properties and structures in the Himalaya and adjoining regions. The Institute also serves as a database/National reference center for Himalayan Geology. It is equipped with state-of-the art laboratory and field equipment facilities for geoscientific data acquisition, data analysis/processing, and interpretation. Besides analytical data generation, it also provides consultancy services related to geoengineering projects, ground water surveys and natural hazards. Institute houses a beautiful geological museum within its campus.

In and around the city of Dehradun

Dehradun is a beautiful and scenic valley located between the Lesser Himalayan formations to its North and the Siwaliks to its South. Dehradun is situated ~54 km from Haridwar, ~45 km from Rishikesh and ~32 km from Mussoorie. There are a number of places for tourist attractions in and around the city. The altitude of the city is about 700 metre and the temperature during the month of November fluctuates between 11° and 26 °C. There are many flights operating daily from Delhi, Mumbai, Kolkata, Bengaluru, Lucknow, Hyderabad, Prayagraj and Pant Nagar to Dehradun and back. Dehradun is also well connected with the railways. There are trains from Delhi and many other Indian cities. The road distance from Delhi to Dehradun is about 260 km that takes ~5-6 hrs to drive. There are government buses operating from Delhi-Dehradun.

Dehradun is suitably located between the two geologically important continental scale tectonic boundaries i.e. the Himalayan Frontal Thrust (HFT) to the south and the Main Boundary Thrust (MBT) to the north. The rocks between the HFT and MBT comprise Mid Miocene and younger Siwaliks and those above MBT are Lesser Himalayan Meta sediments that include Krol Tal sequence bearing the signs of most primitive life. Therefore, the conference attendees will have opportunity to visit the HFT and MBT and Krol Tal sedimentary belt. The famous localities of Robbers Cave and Sahastradhara are also there in the vicinity of the Karst caves and caverns drained by fresh water and sulphur springs, respectively. The religious places of Rishikesh and Haridwar, where the holy river Ganga and its alluvial fans make exit to the plains, are at one hour drive from the host institute.

Chief Patron

Lt. Gen. Gurmit Singh, PVSM, UYSM, AVSM, VSM (Retd.)
Governor of Uttarakhand

Patrons

Dr. Subhas Sarkar, Hon'ble Minister of State for Education, GoI

Dr. Rajesh Gokhale, Secretary, DST, GoI

Dr. M. Ravichandran, Secretary, MoES, GoI

Prof. Talat Ahmad, Chairman, GB, WIHG

Prof. Sailesh Nayak, Chairman, RAC, WIHG

Conference Directors

Prof. Kalachand Sain, Director, WIHG

Prof. R. Jayangondaperumal

Dr. A. Krishnakanta Singh

Registrar, WIHG

Conveners

Dr. Vikas Adlakha

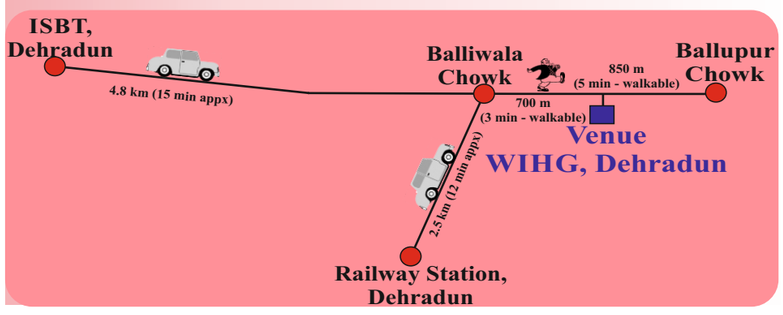
Dr. Priyadarshi Chinmoy Kumar

IMPORTANT DATE

Abstract Submission: Open Now
Abstract submission deadline: 26.08.2023
A Short Field Trip: 14.09.2023

CONTACT DETAILS

Dr. Vikas Adlakha **+91 9416810084**
Dr. Priyadarshi Chinmoy Kumar **+91 9337044834**



Wadia Sophisticated Analytical Instrument Facilities

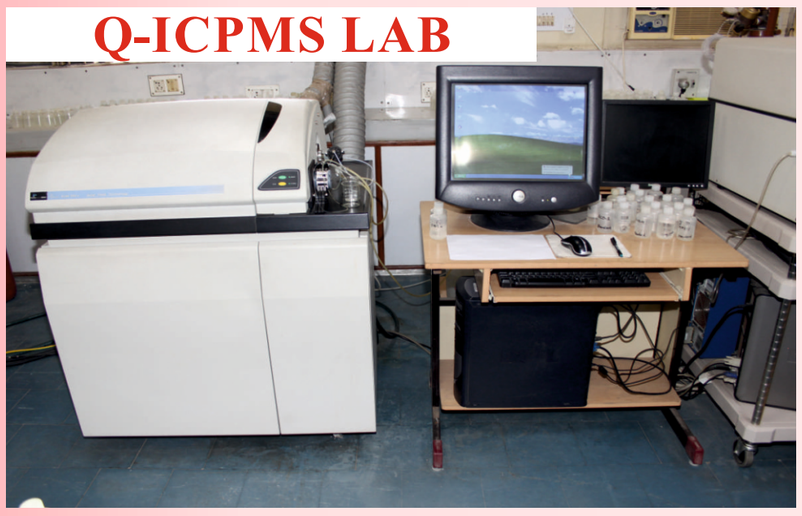
Wadia Sophisticated Analytical Instrument Facilities (WSAIF) is a core research division of the Wadia Institute of Himalayan Geology (WIHG) that provides professional and world-class analytical services.The state-of-the-art sophisticated analytical laboratories strongly substantiate the field data for understanding the geodynamic evolution of the Himalaya, geological surface processes such as landslides, avalanches, cloud bursts and extreme events, and to characterize and mitigate natural geohazards. Additionally, the sub-surface processes such as earthquakes, crustal heterogeneities, elastic strain and convergent rate, crustal and mantle interaction are probed by profound geophysical instrumentation and modern analytical techniques. Besides adding significance to the knowledge base, the Institute also provides geoscience support to other government agencies and stakeholders. the WSAIF also caters to the analytical facilities of various universities, IIT's, IISER, and other state and central government organizations. The organizers welcome all the participants to visit our facilities.

LA-MC-ICPMS LAB

SEM LAB

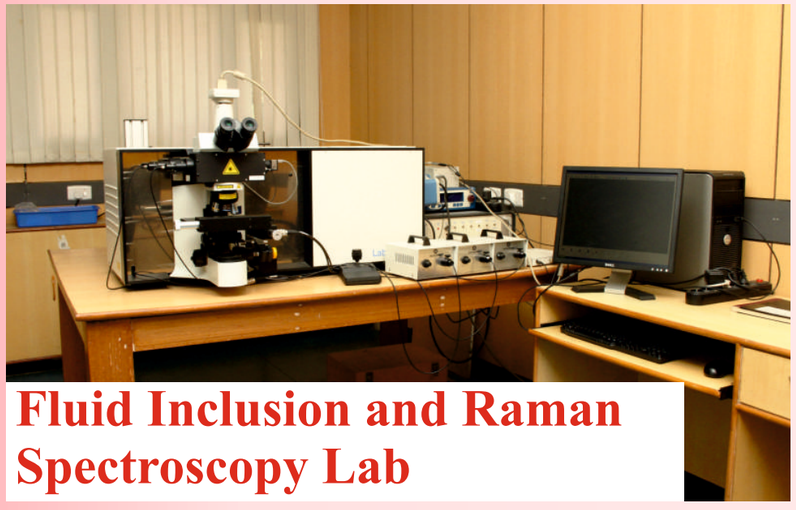
XRF LAB

Q-ICPMS LAB



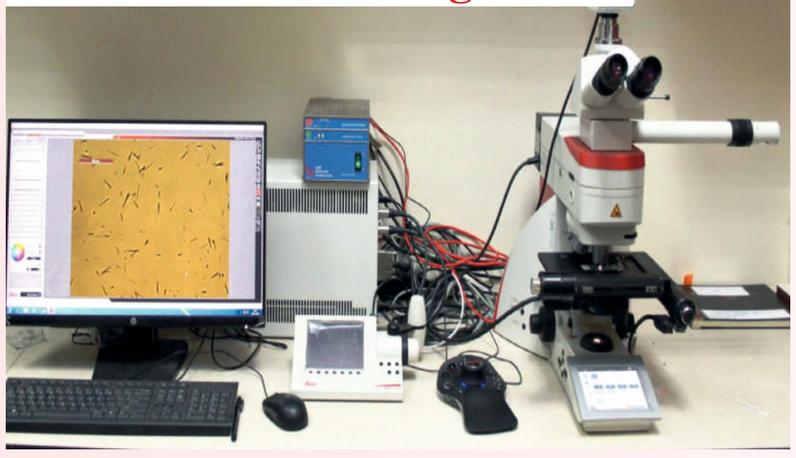
IRMS LAB

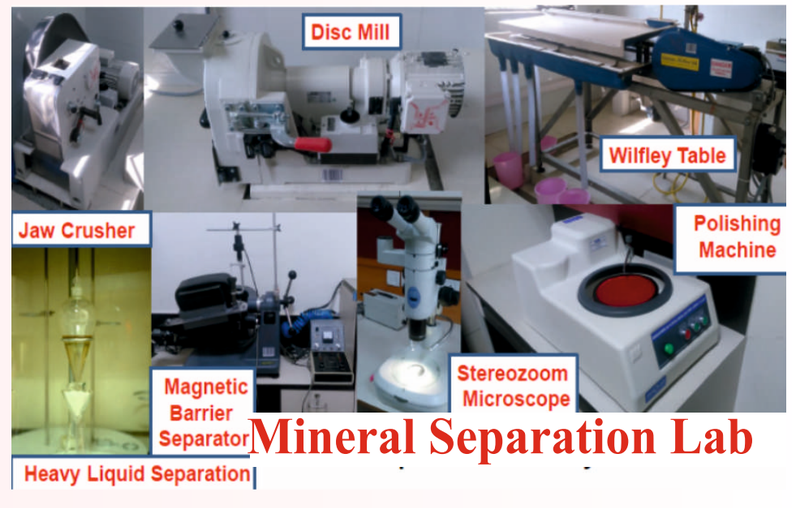
TL & OSL LAB



Fluid Inclusion and Raman Spectroscopy Lab

Fission Track Dating Lab





Mineral Separation Lab

About Dehradun

Dehradun, the capital of Uttarakhand State is situated in the foothills of the Himalayas. This city is the gateway to many tourist places like Mussoorie, Haridwar, Rishikesh, Badrinath, Kedarnath, Gangotri, Yamunotri, Tungnath, Rudranath and Madmaheshwar.

Major Attractions in Dehradun

Forest Research Institute

Forest Research Institute is spread over 4.5 square kilometers and has an imposing Colonial and Greco-Roman styles of architecture. This premier institution in the field of forestry research in India. This institute has been internationally acclaimed due to its developed infrastructure and various notable courses offered here.

Tapkeshwar Temple

The Tapkeshwar Temple is a humble cave shrine dedicated to Lord Shiva. This revered temple is situated along the banks of a river which imparts it a unique sanctity. A Shiva Linga is enshrined in the main complex which is believed to grant the wishes of all the devotees. Water trickles from the ceiling continuously on the Shivalinga, making it an interesting spectacle to watch.

Sahastradhara

Sahastradhara literally means 'thousand-fold spring'. It is a popular attraction, famous for its ecstatic beauty and therapeutic value since its water contains Sulphur. While the place can be visited any time during the year, you would love beauty of the waterfall during the rainy season when the stream proposes the appearance of a gushing torrent.

Geological Museum

The S. P. Nautiyal Museum of WIHG takes you to millions of year back to the geological past of the Himalaya and mother Earth. The museum displays geological maps, charts, sample specimens of rocks and minerals, and models of Himalayan evolution for the awareness of general public. It also exhibits video films on the Himalaya and general geology.

Laxman Sidh Temple

A Popular temple, Laxman Siddh is around 12 kilometres from Dehradun on Haridwar-Rishikesh road, Uttarakhand, India. The temple is easily accessible by uncountable devotees especially on Sundays from all over the world. It is also the cremation site of Saint Swami Laxman Siddh and to pay the homage to the saint, multiple devotees gather at the holy Samadhi (penance) here. This temple is famous for the peace and tranquility it offers visitors. The temple is also a great place for bird watchers.

Dehradun Zoo

Located at the base of the Shivalik range, Dehradun Zoo is a zoological garden, and it is home to horned Deer, Tiger, Neelgai, Peacock and many other animals. Heaven for all the nature lovers out there, the beauty of the place is worth spending time at. Rich in flora and fauna, the park is a great point to unwind and break away from the busy life of the city.

Sai Darbar

The Sai Darbar Temple is a standout amongst the most beautiful and well known temples in Dehradun. Devoted to Shirdi Sai Baba, the temple is regularly visited by numerous aficionados crosswise over diverse beliefs. The Sai Darbar Temple is built of marble and the icon of Sai Baba is set amidst the temple.

Tibetan Temple

The Mindrolling Monastery was established in 1676 by Rigzin Terdak Lingpa which was re-established in Dehradun by Khochhen Rinpoche along with a group of monks in 1965. The monastery is not only a tourist attraction but also a destination where on a daily basis almost hundreds of individuals attain spirituality. Numerous beautiful gardens, large areas, and a stupa are all situated within the perimeter of the monastery. The monastery is an unnatural beauty owing to its gardens, university complex and the tallest Stupa in Asia surrounded by greenery. It also has numerous shrine rooms, Tibetan art forms, and murals.

Robber's Cave

Robber's cave is a river cave formed in the Himalayas and is mostly visited by tourists seeking the adventure of witnessing this natural formation that has river water flowing from the middle of a cave. It is a perfect location for those seeking adventure and thrill. Locals call it Guchhu Pani and also believe that it is home to Lord Shiva. Tourists can explore this 600 metres long cave that has been divided into two main parts. If you happen to walk a little further through the stream, you can also spot splendid waterfall.

Lachhiwala

Surrounded by Sal trees, this place is a relaxing and serene picnic spot known for gorgeous sunset views, trekking trails, and bird watching. Located on the Dehradun-Rishikesh Road, Lacchiwalla is renowned for its lush greenery, scenic beauty and pleasant climate all through the year. Birdwatchers will especially enjoy spotting the many different species of colourful birds.

Santala Devi Temple

Santala Devi Temple is situated on a cliff at an altitude of 2083 m near Jaitunwala in Dehradun. This temple has great cultural and religious significance. According to legend, Santala Devi, along with her brother, on realizing that they would not be able to fight with Mughal Army, abandoned their weapons and began to pray the god. A divine light emerged as a conse-quence and they both turned to stone statues. It is within the fort that the shrine was built and Saturdays marks the transformation of the Goddess into stone. On every Saturday, number of devotees visiting this shrine as it is regarded as the day of Goddess Santala.

Tapovan

Tapovan is a holy place is known for releasing the tension and providing a sense of satisfaction as well as peace of mind to the visitors. It is a very famous place to go for meditation and to escalate one's spirit. Devotees flock to the place frequently in the quest to find inner peace.