



# International Workshop and Winter School



on

## HANDS-ON-TRAINING

on

### Instrumentation and Analytical Techniques

FOR

**ATMOSPHERIC AEROSOL MEASUREMENTS, SOURCE  
APPORTIONMENT AND PREDICTION OVER BHARAT**

**18<sup>th</sup> – 22<sup>nd</sup> March 2024**

Venue : Mini Auditorium in Center for Folk and Performing Arts, HNBGU Srinagar

**ATMOSPHERIC AND SPACE PHYSICS LABORATORY  
DEPARTMENT OF PHYSICS**

**in collaboration with**

Department of Instrumentation Engineering/USIC  
Aerosol, Air Quality and Climate Change Research Society (AACCRS)  
Srinagar Garhwal, Uttarakhand, India  
High Altitude Plant Physiology Research Center  
HNBGU (A Central University) Srinagar Garhwal, Uttarakhand India  
Municipal Post Graduate College, Mussoorie, Uttarakhand.  
Alpine Institute of Management and Technology, Dehradun  
Dhanauri P. G. College, Dhanauri, Haridwar Uttarakhand, India

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Prof. T. C. Upadhyay, Department of Physics, HNBGU, Srinagar Garhwal  
Prof. Hemvati Nandan, Head, Department of Physics, Birla Campus, HNBGU Srinagar Garhwal

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Dr. Alok Sagar Gautam, Department of Physics, HNBGU Srinagar



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Dr. A.K. Kamra Senior, INSA Scientist, IITM Pune.  
Prof. S.N. Tripathi, IIT Kanpur.  
Prof. Anil Kumar Chauhan, Principal Municipal PGC, Mussoorie  
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Prof. P.D. Semalty, Dept. of Physics, SRT Campus, Badshahithaul Tehri

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Dr. Vishal Rohilla, Dept. of Instrumentation Engineering, HNBGU, Srinagar  
Dr. Dilip Kumar Meena, Dept. of Physics, SRT Campus HNBGU, Srinagar  
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Dr. Surendra Pratap Singh, G.D.C., Mainpuri  
Dr. Sneha Gautam, KITS, Coimbatore  
Dr. Gambheer Singh Kathait, Dept. of Instrumentation Engineering, HNBGU, Srinagar  
Dr. Manish Uniyal, Dept. of Physics, BGR Campus, HNBGU Sringar  
Dr. V. S.Bisht, Dept. of Instrumentation Engineering, HNBGU, Srinagar

### **H. N. B. GARHWAL UNIVERSITY (A CENTRAL UNIVERSITY)** **SRINAGAR GARHWAL UTTARAKHAND**

Established under the U.P. State Universities Act (1973), then named Garhwal University, it

was founded in December 1973. It was rechristened in 1989 as Hemvati Nandan Bahuguna Garhwal University. Today, this university is among the ten largest universities in the country with 3 campuses and more than 180 affiliating colleges and institutes (both state-run and self-financed). Since its inception, despite limited resources and various geographical constraints, the university has charted a course of growth and development to gain important recognition as one of the better universities in India. As a mark of appreciation for its academic achievements, HNB Sub Garhwal University was upgraded as a Central University under the Central Universities Act, 2009. The university is located at Srinagar (105 km from Rishikesh) on the banks of the river Alaknanda, one of the major tributaries of the river Ganga. The serene environment presents a near-perfect setting for intellectual pursuits. University Website: <https://hnbgu.ac.in>

### **ATMOSPHERIC AND SPACE PHYSICS LABORATORY**

The Atmospheric and Space Physics Laboratory at the Department of Physics, Chauras Campus, is fully equipped with state-of-the-art research facilities in the areas of Physics, Atmospheric Physics, Space Physics, etc. This laboratory is dedicated to advancing our understanding of the Earth's atmosphere and its interactions with the space environment,



with implications for weather forecasting, climate science, and space exploration. It is equipped with specialized instruments and equipment for conducting experiments and observations related to atmospheric science, aeronomy, and space physics

### **VISION BEHIND THE INTERNATIONAL WORKSHOP AND WINTER SCHOOL**

To meet the objectives of this International Workshop and Winter School, chemical speciation and source apportionment studies are required in all non-attainment cities of



India. Primary knowledge of chemical composition and methods of chemical speciation is crucial for identifying pollution sources. Environmental radioactivity, including Radon, Thoron, and progeny measurement, offers insights into aerosol sources and behavior. Radio-analytical techniques are vital for characterizing aerosol properties and tracing their origins. The importance of AI and ML tools in air quality, weather, and extreme weather prediction should also be emphasized. A pool of trained manpower is necessary to conduct and supervise such studies. This winter school will blend in-class, theory-based training with hands-on operational training, focusing primarily on techniques for chemical speciation and source apportionment of aerosols. Hands-on training with available aerosol and natural radioactivity sampling and analysis equipment will provide attendees with a good understanding of methods.

## **PRIMARY OBJECTIVES OF THE INTERNATIONAL WORKSHOP AND WINTER SCHOOL**

1. To provide conceptual knowledge on physio-chemical properties and source apportionment techniques of aerosols.
2. To provide hands-on training in the instrumentation and analytical methods needed for physio-chemical speciation and source apportionment of aerosols and Nuclear Radiation
3. To provide training on post-analysis data interpretation, multivariate statistical methods along with handling and analysis of Instrumental, satellite & meteorological data.

## **SESSION THEMES**

- Aerosol measurement technique and modeling
- Non-destructive characterization techniques of Aerosols and materials.
- Environmental radioactivity with the measurement of Radon, thorn and their progeny.
- Nuclear and radio-analytical techniques.
- Radio chemistry and Nuclear instrumentation.
- Recent advancement in aerosol chemistry and source appointments methods
- Satellite-based measurement techniques of aerosols
- Aerosol system over high-altitude Himalayas based on observations simulations and their potential impacts on glaciers, radiation budget and Hydro power Resources.
- Impact of aerosols on lightning and rainfall patterns in the Indian context
- Importance of AI and ML tools in air quality, weather, and extreme weather prediction

## **TARGET GROUP FOR THE INTERNATIONAL WORKSHOP AND WINTER SCHOOL**

- Scientists/officials/consultants of Pollution Control Boards/committees.

- Faculty/research scientists/consultants involved in aerosol Physics, applied physics.
- Limited seats for PhD scholars working on related problems.

### **HANDS ON TRAINING ON FOLLOWING INSTRUMENTS**

S. No.	Instruments	S. No.	Instruments
1.	Satellite observations and AI/ML Approaches	11.	Pinhole Dosimeter
2.	High-Performance Thin-Layer Chromatography (HPTLC)	12.	Fourier Transform Infrared Spectroscopy (FTIR)
3.	So <sub>2</sub> Analyser	13.	Lightning location Sensor Network
4.	Aethalometer	14.	Spark Counter
5.	Direct Progeny Sensor	15.	UV-Visible Spectrophotometer
6.	High-Performance Liquid Chromatography (HPLC)	16.	RnDuo
7.	Flash Chromatography	17.	X-ray Diffractogram (XRD)
8.	Scanning Electron Microscope (SEM)	18.	Scanning Mobility Particle Sizer (SMPS), Particulate Matter (PM) Samplers
9.	Inductively Coupled Plasma Mass Spectrometry (ICPMS)	19.	Solid State Nuclear Track Detector
10.	Automatic Weather Station	20.	Gas Chromatography Mass Spectroscopy (GC-MS)

### **REGISTRATION FEE**

<b>International Workshop-2 Days</b>	
With Accommodations Limited Seats Aprox. 150 only.*	Without Accommodations Limited Seats Aprox. 50 only.*
Rs. 1500 (Students / PhD Scholars)	Rs. 1000 (Students / PhD Scholars)
Rs. 2500 (For Faculties/Scientist)	Rs. 1500 (For Faculties/Scientist)
<b>Winter School (Workshop + Hands on Training)-5 Days*</b>	
Rs. 3000 (Students / PhD Scholars)	Rs. 1500 (Students / PhD Scholars)
Rs. 4000 (For Faculties/Scientist)	Rs. 2000 (For Faculties/Scientist)

**\*SELECTION CRITERIA : FIRST COME FIRST SERVE**

## **IMPORTANT DATES**

Deadline for abstract Submission/registration	: 5 <sup>th</sup> March, 2024
Display of list of selected candidates on regd. email	: 6 <sup>th</sup> March, 2024
Deadline for submission of registration fee	: 10 <sup>th</sup> March, 2024

## **CONTACT DETAILS**

Dr. Alok Sagar Gautam (Course Co-ordinator),  
Dept. of Physics, H. N. B. Garhwal University  
(A Central University), Srinagar Garhwal, Uttarakhand, India  
for any query, please write to us on: [phyalok@gmail.com](mailto:phyalok@gmail.com)/[aachnbgu2018@gmail.com](mailto:aachnbgu2018@gmail.com)  
or

WhatsApp no. +91-9997138763 (Dr. Alok Sagar Gautam)  
WhatsApp no. +91-7895265238 (Mr. Sanjeev Kumar, RS)  
WhatsApp no. +91-7409401973 (Mr. Abhishek Joshi, RS)  
WhatsApp no. +91-7060820066 (Mr. Karan Singh, RS)  
WhatsApp no. +91-8869062901 (Mr. Shyam Nautiyal, RS)  
WhatsApp no. +91-9528134675 (Mr. Amandeep Vishwakarma, RS)  
WhatsApp no. +91-9412934486 (Ms. Yasti Panchbhaiya, RS)

## **NOTE:**

Scan the QR code for registration/nomination form or just click on  
[https://docs.google.com/forms/d/e/1FAIpQLSecafKmO5gxLNOiVzbGGrLZh-8-yduor8g68dS\\_zyynX3hspg/viewform](https://docs.google.com/forms/d/e/1FAIpQLSecafKmO5gxLNOiVzbGGrLZh-8-yduor8g68dS_zyynX3hspg/viewform)

