



## ADVANCES IN ROCK MAGNETISM AND MAGNETIC FABRIC AND ITS APPLICATIONS

(A CSIR - Integrated Skill Initiative)

March 17 - 26, 2025



**CSIR- NATIONAL GEOPHYSICAL RESEARCH INSTITUTE**  
Uppal Road, Hyderabad - 500007



CSIR Integrated Skill Initiative

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## **ABOUT THE INSTITUTE**

Established in the year 1961, the CSIR-National Geophysical Research Institute (CSIR-NGRI) primarily dedicated to R&D activities encompassing geodynamics, earthquake hazard assessment and exploration of natural resources. Paleomagnetism is an important fundamental research subject in Geophysics and is an important research area at the institute. Paleomagnetism activity at CSIR-NGRI deals with the continental drift and reconstruction of the continents, rock magnetism, Anisotropy of Magnetic Susceptibility, Environmental & Archaeo- magnetism, Paleo-intensity studies to decipher the Earth's Geodynamic components. Being a national institute, CSIR-NGRI has been imparting training to postgraduate students, research scholars and professionals in various topics of the Earth Sciences to enhance their skills in their respective fields of work. Rock Magnetism training program is initiated for the first time in the Institute.

## **ADVANCES IN ROCK MAGNETISM AND MAGNETIC FABRIC AND ITS APPLICATIONS**

Rock magnetism is the study of the magnetic properties of rocks, sediments, and soils, which can reveal information about the Earth's past geomagnetic field and tectonic movements. It involves the analysis of natural remanent magnetization, helping to reconstruct historical plate tectonics and environmental changes. Understanding rock magnetism is essential for geophysics and paleomagnetism, making it a significant field in geological sciences. Rock magnetism is a valuable tool in archaeology, assisting researchers in uncovering insights about historical geophysical events and providing data for dating archaeological findings. This becomes particularly useful in detecting shifts in earth's magnetic field over time, making it an integral part of archaeological studies.

Anisotropy of magnetic susceptibility is an important technique which depicts preferred orientation of magnetic minerals in a rock or unconsolidated sediments. Hence the property is used for study of primary structures and rock fabric. The technique is non-destructive and can be used in nearly all types of rocks because it does not need a rock to contain specific strain markers like deformed fossils, reduction spots, ooids, etc. The method has an advantage as it can determine weak deformation even where lineation and foliation have not developed. In rocks with well developed tectonic fabrics, the principal magnetic susceptibility directions are closely related to orientation of structural features (e.g. fold, fault, foliation, lineation).

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The focus of the ensuing training course would be to understand the concepts and fundamentals of Rock magnetism from field sampling, sample preparation and analysis in the laboratory. There will be lectures on theoretical aspects as well as a demonstration of the state-of-art instrumentation that will provide key skills and the latest knowledge on the above subject to the participants.

### **NEED FOR TRAINING/RE-SKILLING**

Rock magnetic properties are very necessary to characterize in order to know the suitability for Paleomagnetism study. Environmental magnetism study is also equally important to find out the pollution state of the areas around urban, industrial, and thermal power plants. During last three decades, there have been great development including the database, new approaches and techniques demanding the updating of knowledge in this field.

### **TRAINING FOR WHOM**

Postgraduate students, research scholars, and professionals working in the field of geology/geophysics who are interested to update/enhance their skills about the recent advances in this field, are the main target audience of this 9 days residential training program.

### **COURSE STRUCTURE**

The training course includes major themes like fundamentals of Rock magnetism and Anisotropy of magnetic susceptibility and data acquisition. Field visits and assessment of magnetic properties of various rock materials, Laboratory measurements and Invited talks on various branches of Rock magnetism and Anisotropy of magnetic susceptibility. Analysis and Interpretation of acquired data.

### **METHODS OF INSTRUCTION**

Instruction methods involve lectures on theoretical aspects, demonstration of instruments and hands-on training/practice. The medium of instruction will be in English.

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## **MANAGEMENT AND FACULTY**

The training will be imparted mainly by Scientist/Experts of CSIR-NGRI and other University/Institute Professionals.

## **SELECTION PROCEDURE**

Depending upon the number of applicants, the selection cut-off will be decided by Skills Development Section. However, preference will be given to the candidates with minimum 60% or equivalent in their qualifying exam.

## **SPONSORSHIP**

Established academic Institutions/ Government organizations/ industrial sectors are welcome to sponsor candidates of their interest.

## **SALIENT FEATURES OF THE TRAINING**

- 40% Theory and 60% Practical sessions as per the course curriculum.
- Continuous monitoring system for individual trainees.
- Lectures, assisted with models and multimedia aids.
- Tutorials (personal attention).
- Interactive session.
- Hands-on practical exposure on the state-of-the-art equipment/software.
- Guest lecturers from experts.

## **EVALUATION OF TRAINEES**

Evaluation will consist of the following components:

- Interactive session (5%)
- Internal Assessments includes fieldwork, model assignments, teamwork attendance, etc. (15%)
- Written examination (60%)
- Field based Examination, (20%)

## CERTIFICATION

A certificate will be issued to the participants for the successful completion of the course.

<b>Education Qualification</b>	A Master Degree in Geology/Geophysics/Physics/Environmental Science/Remote Sensing and any equivalent/allied field.
<b>Nationality</b>	Indian Nationals
<b>Duration</b>	March 17 - 26, 2025
<b>Venue</b>	CSIR- National Geophysical Research Institute, Uppal Road, Hyderabad - 500007
<b>Last Date for Applying</b>	February 16, 2025
<b>Number of Seats</b>	30
<b>Course Fee*</b>	Rs. 2,500/- + 18% GST = 2950/- (for Master, Diploma/Degree students) Rs. 5,000/- + 18% GST = 5900/- (for Ph.D. Students) Rs. 10,000/- + 18% GST = 11800/- (for Faculty and Industry sponsored)
<b>Food</b>	Breakfast and Dinner will be available at nominal rates in NGRI Campus payable by the participants.
<b>Accommodation Charges</b>	NGRI guest house on twin sharing basis at the rate of Rs. 300/- per head per day for the first 6 days and 7th day onward Rs. 600/- per day per head. Skills Development quarters (Rs. 100/- per head per day) and staff quarters/research scholars hostel (Rs. 50/- per head per day) on twin sharing basis
<b>Course Coordinators</b>	Dr. M. Venkateshwarlu (Email: mvwarlu@ngri.res.in) Dr. A. V. Satya Kumar (Email: satyav@ngri.res.in)

\* Course fee includes training fee, course material, working lunch, Tea and Snacks. It should be paid through online by the shortlisted participants.