Research Facilities

The Department of Geophysics has the following research facilities:

1. Seismological Observatory

The department has a laboratory 'Seismological Observatory' that is equipped with seismological instruments and records earthquakes 24X7 basis throughout whole India. The observatory has also the instruments of the National Telemetry Observatory of Ministry of Earth Sciences, Govt of India, New Delhi. The observatory has following equipments:

- Broad Band Sensor (STS-2),
- Short Period sensor SS-1 (Kinemetrics).
- The recorder is ANUS K2
- Q330 R data loggers
- Global Positioning System (GPS)
- Digital Accelerometers





2. Centre for Advance Research in Earthquake Studies (CARES)

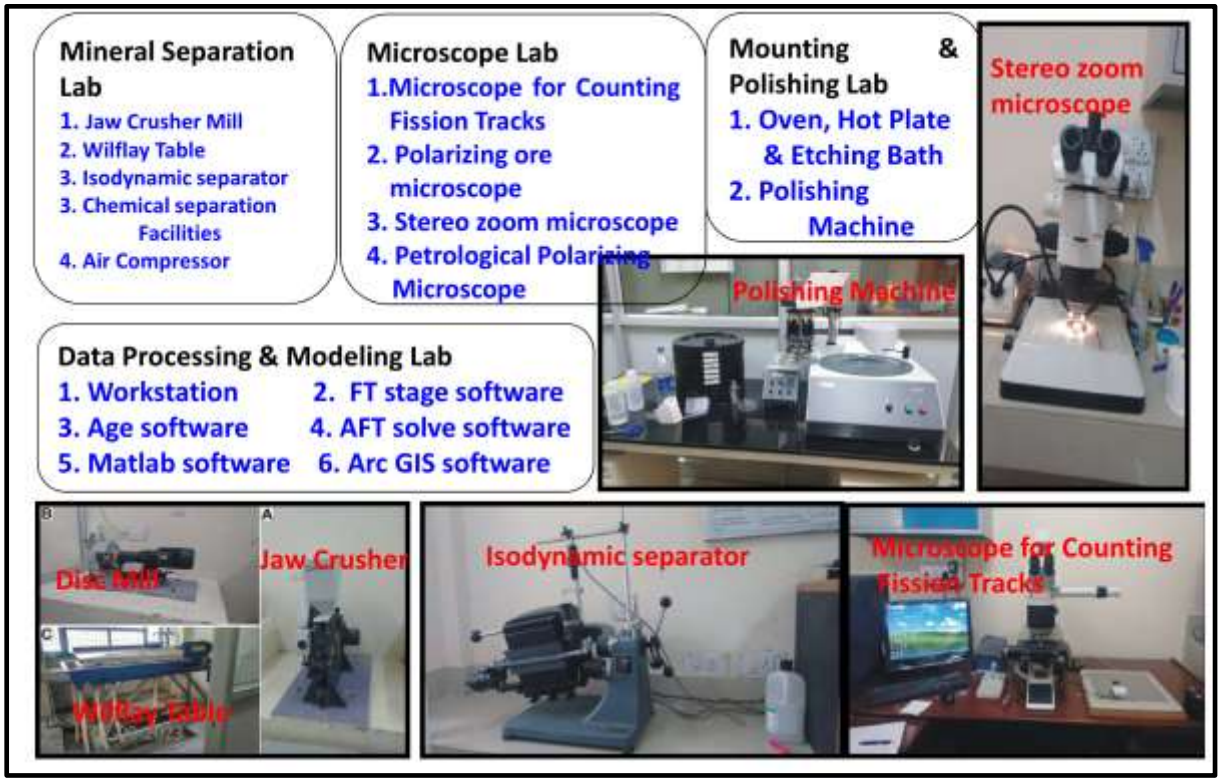
The department has received Rs. 3.00 crore fund from Rashtriya Uchchatar Shiksha Abhiyan (RUSA 2.0) to establish a dedicated centre for earthquake monitoring in Haryana and adjoin regions. The main objectives of the CARES are to monitor earthquake activities in and around Haryana region through modern digital technology, to understand the physical processes related to earthquake genesis, to create public awareness about earthquakes, to prepare microzonation and hazard maps and to impart training to the students and other stakeholders.

The centre is establishing 06 remote seismic stations equipped with 06 broadband seismometers and 06 accelerometers. The online seismic data from these stations will be received at Central Receiving Station (CRS) established at KUK. The CRS will have the capability of 24X7 monitoring of earthquake activities using high end server, workstations and

computer PCs. It will monitor continuous seismic waveforms, station health and locations of earthquakes.

3. National Facility on Low-Temperature Thermochronology (Fission Track Dating) (Funded by DST, Govt. of India)

Fission Track (FT) Dating has become one of the most important tools for geoscientists working in different fields of earth sciences. However, hardly few geoscientists in India are using this technique in their research work mainly because of non-availability of the fission track dating facility. FT ages are determined by the external detector method with reference to an analyst-specific zeta calibration factor determined by multiple analyses of mineral age standards. For data analysis, the laboratory is equipped with Leica and Olympus microscopes with automated Kinetic XY stages, and digitising tablets under computer control. Uranium maps of sample grain mounts are produced by irradiation in the research reactor outside. Recently, the lab has already upgraded to National Facility by DST, Govt. of India.



4. Geophysical Instrument Lab

The Department the following geophysical equipments in the different specialization of Geophysics:

a) Gravity meter: The Department has one CG-5 AUTOGRAV Gravity meter for gravity surveys to explore minerals and hydrocarbon reserves.

b) Ambient Vibrating Noise Recording Systems:

The department has 03 sets of ambient vibrating recording system to record the natural earth vibration for seismic microzonation to estimate site amplification function and predominant frequency.

c) Proton Processing Magnetometer: The department has one set of G-857 Portable Proton Magnetometer for the magnetic survey for mineral exploration, environmental and archaeological studies.

d). Engineering Seismograph: The department has Multichannel Analysis of Surface Wave (MASW) based 24-channel engineering seismograph (McSEIS-SX) which is used for the measurement of Vs30 and depth of bedrock in seismic microzonaton.

e) Resistivity Imaging System – These instruments are used for the resistivity imaging of earth to delineate conductive and non-conductive bodies. This system consist following equipments:

1. Syscal Kid-24 2. CRM Auto-C Aquameter)

f) Differential Global Positioning system: The department has one set of DGPS containing 01 controller and 02 GNSS receivers which is used for the height measurement from mean sea level for corrections in Gravity and magnetic surveys.

5. Seismic Data Processing/Computational Lab: The Data processing laboratory has computers with Python installed. The MatLab and remote sensing Laboratory has Matlab and Erdas Imagine software installed. The Computer Laboratory provides facility for FORTRAN, C, C++ programming. The total sitting capacity in the computer laboratory is up to seventy students. There are total of thirty-three computing equipment.

6. Geoinformatics Lab

This lab is equipped with the following hardwares and softwares:

- One computer server with twelve computer PC nodes
- Erdas Image Processing Software
- GIS Software
- Matlab (2010 version) with 10 users

5. Departmental Library

- It is stocked with more than 2000 books, journals and e-resources (e-journals, e-books, open-access journals etc.)
- It contains text and reference books of all disciplines of Geophysics
- There is also one SPG/SEG library comprising of books donated by Society of Exploration Geophysicists (SEG, USA) and Society of Petroleum Geophysicists. Journals named "Leading Edge" and "Geophysics" are being regularly received by the Department form SEG, USA.

6. Geophysical Softwares available in the Department

- **WingLink**
  This is used for the electromagnetic, magnetotelluric, electrical and Gravity data processing
- **Res2Dinv, Res3Dinv**
  This is used for data processing of 1-D and 2D electrical resistivity tomography
- **Grilla**
  This is used for data processing of ambient data for the estimation of site amplification and fundamental frequency
- **Erdas Imaging and ArcGIS**
  These softwares are used for image processing
- **GEODEPTH, FOCUS , Smart Refract**
  These are used for seismic refraction and reflection data processing
- **Zmap, PITSA and Seisan** (for earthquake data analysis)
- **MATLAB** version 2010 and 2021 (10 + 2 users)