



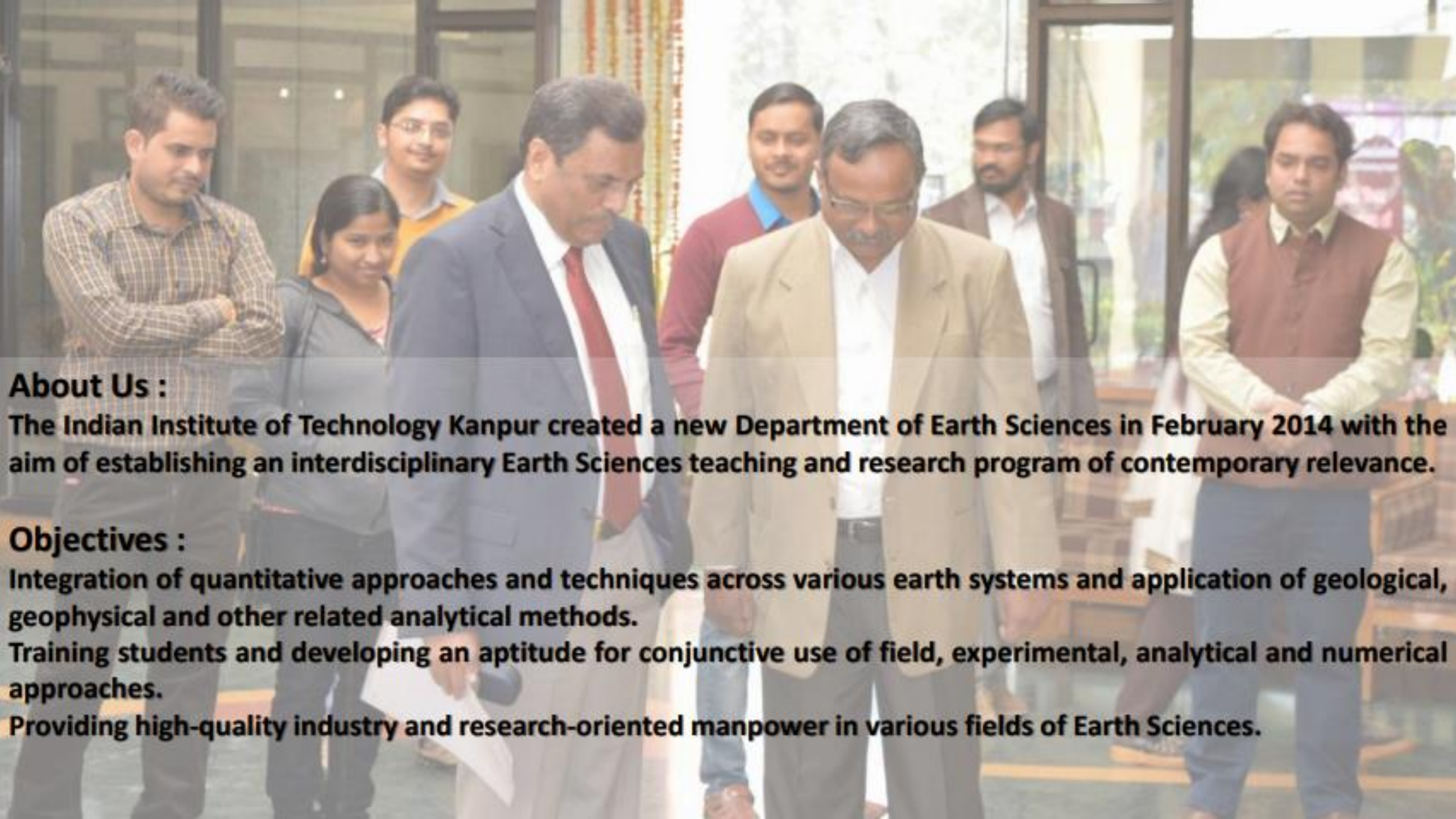
**DEPARTMENT OF
EARTH SCIENCES**

IIT KANPUR

**PLACEMENT
BROCHURE
2021-22**



3D MODEL OF THE DEPARTMENT



About Us :

The Indian Institute of Technology Kanpur created a new Department of Earth Sciences in February 2014 with the aim of establishing an interdisciplinary Earth Sciences teaching and research program of contemporary relevance.

Objectives :

Integration of quantitative approaches and techniques across various earth systems and application of geological, geophysical and other related analytical methods.

Training students and developing an aptitude for conjunctive use of field, experimental, analytical and numerical approaches.

Providing high-quality industry and research-oriented manpower in various fields of Earth Sciences.

FROM HOD'S DESK

“The BS-MS and M. Tech. students of the Department of Earth Sciences, IIT Kanpur get thorough academic training that includes course works on fundamental and applied Earth Sciences as well as hands-on training on analytical techniques relevant to our society. Particularly, they learn about natural resources (identification and exploration techniques), Solid Earth geology, Quaternary geology, Sedimentology and Basin analysis, Natural hazards, and Applied geochemistry, etc. Our students are well-trained with the theoretical aspects of hydrocarbon exploration from the basic to advanced stages, theoretical and practical Rock Mechanics, Rock Physics, and different geophysical exploration techniques with laboratory-based components. They visit several exploration industries, their mining sites, and beneficiary plants. In our teaching program, field geology is one of the essential components with emphasis on geological mapping and interpreting geological structures. IIT Kanpur campus environment encourages students to develop as better human beings, leaders, and team members.”



DEBAJYOTI PAUL
Professor and Head
Earth Sciences

Academic programs and Specializations

BS-MS in Earth Sciences

1) Geology :

Geology of Fuels, Structural Geology, Sedimentary Processes and Stratigraphic Principles, Hydrology, Engineering Geology, Economic Geology

2) Geophysics :

Fundamentals of Geophysics, Exploration seismology, Geophysical methods, Potential Field Theory and application, Well logging, Remote sensing

3) Solid Earth studies :

Earthquake seismology, Petrology, Rock Mechanics, Geochemistry, Geodynamics

4) Natural Hazards :

Tectonic Geomorphology, Flood risk and mitigation, Disaster management

5) Elective courses :

Advanced courses of PG level offered by Department, Open Electives by Institute

M. Tech Geological Technology

1) Compulsory courses :

Applied Geophysics and Well logging, Mathematics in Earth Sciences, Instrumentation in Earth Sciences, Remote Sensing and Geo-Source Evaluation

2) Elective courses :

Geochemistry and Geology of Petroleum, Solid Earth Geophysics, Advanced Structural Geology, Experimental Rock Deformation and Rock Physics, Applied Sedimentology and Basin Analysis, Natural Hazards

FACULTY



Debajyoti Paul
Professor & Head, PhD, Cornell University,
USA
(Geochemistry, Mantle Dynamics,
Paleoclimate Reconstruction)



Rajiv Sinha
Professor, PhD, University of Cambridge
(Morphology-ecology Linkages, Remote Sensing
and GIS Applications, Climate Change and
Paleoclimate Reconstruction)



Santanu Misra
Associate Professor, PhD, Jadavpur University,
India (Structural Geology and Tectonics,
Experimental Rock Deformation and Rock
Physics)



Dibakar Ghosal
Assistant Professor, PhD, IPGP, France
(Exploration Seismology, Poro-elastic attribute
analysis, Modelling and Inversion, Subduction
Tectonics)



Deepak Dhingra
Assistant Professor, PhD, Brown University, USA
(Planetary Vis-NIR Remote Sensing, Lunar
Geology, Characterization of Enceladus plume,
Impact cratering)



Javed N. Malik
Professor, PhD, M.S. University of Baroda
(Active Tectonics and Paleo seismology,
Geomorphology, Paleo tsunami)



Indra Sekhar Sen
Assistant Professor, PhD, Florida International
University, USA (Radiogenic and Stable Isotope
Geochemistry, Petroleum Exploration with
Geochemical Tools, Anthropocene and Environment)



Animesh Mandal
Assistant Professor, PhD, IIT Kharagpur, India
(Exploration Geophysics, Modelling and Joint
inversion, Geophysical data
processing/enhancement)



Ishwar Kumar
Assistant Professor, PhD, IISc Bengaluru, India
(Earth crustal and surface processes interaction
Petrology, Tectonics and Archean Crustal Evolution
Paleogeography, Remote sensing and GIS)



Amar Agarwal
Assistant Professor, PhD, IIT-Roorkee and KIT-
Germany
(Applied Structural Geology, Impact Cratering, Rock
Magnetism)

Schlumberger activities with the department

- ▶ The world's largest oilfield service provider company "Schlumberger" has been associated with Earth Sciences department at IIT Kanpur from 2017.
- ▶ Schlumberger day has been celebrated on 3rd - 4th October where technical events like:
 - ❖ Case studies
 - ❖ Poster presentation etc., were conducted.
- ▶ Since then mutual sharing of knowledge between the institute and the company has been entrenched.



Placement record of Y17 PGs



Prabhati Sen



Saket Patidar

Internship offer to Y18 PGs



Anjali Dixit



Himanshu Singh Gehlot

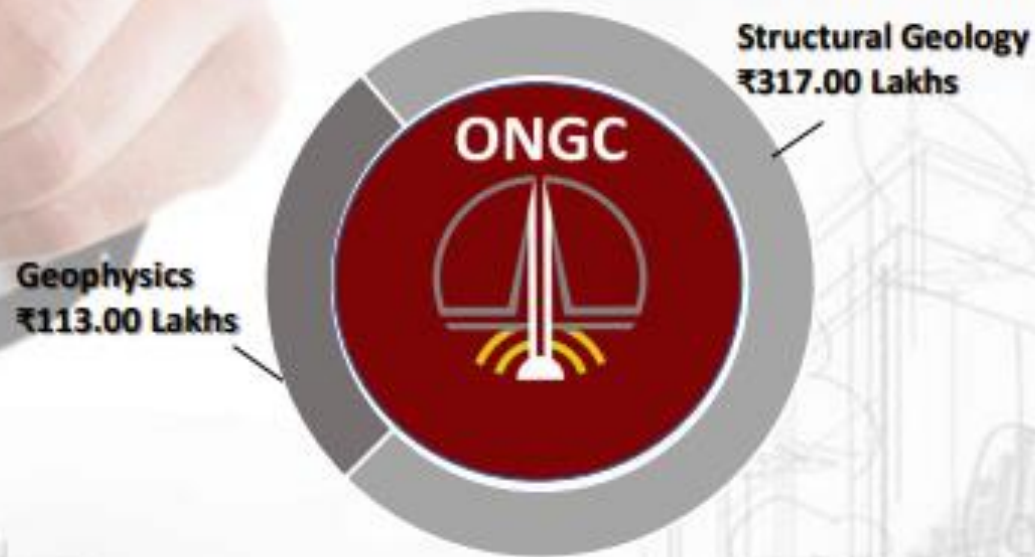


Aashee Shukla

***The department is now looking towards spreading roots and establish a promising relation with major oil and gas companies.

MAJOR ONGOING PROJECTS

Ongoing Hydrocarbon Projects



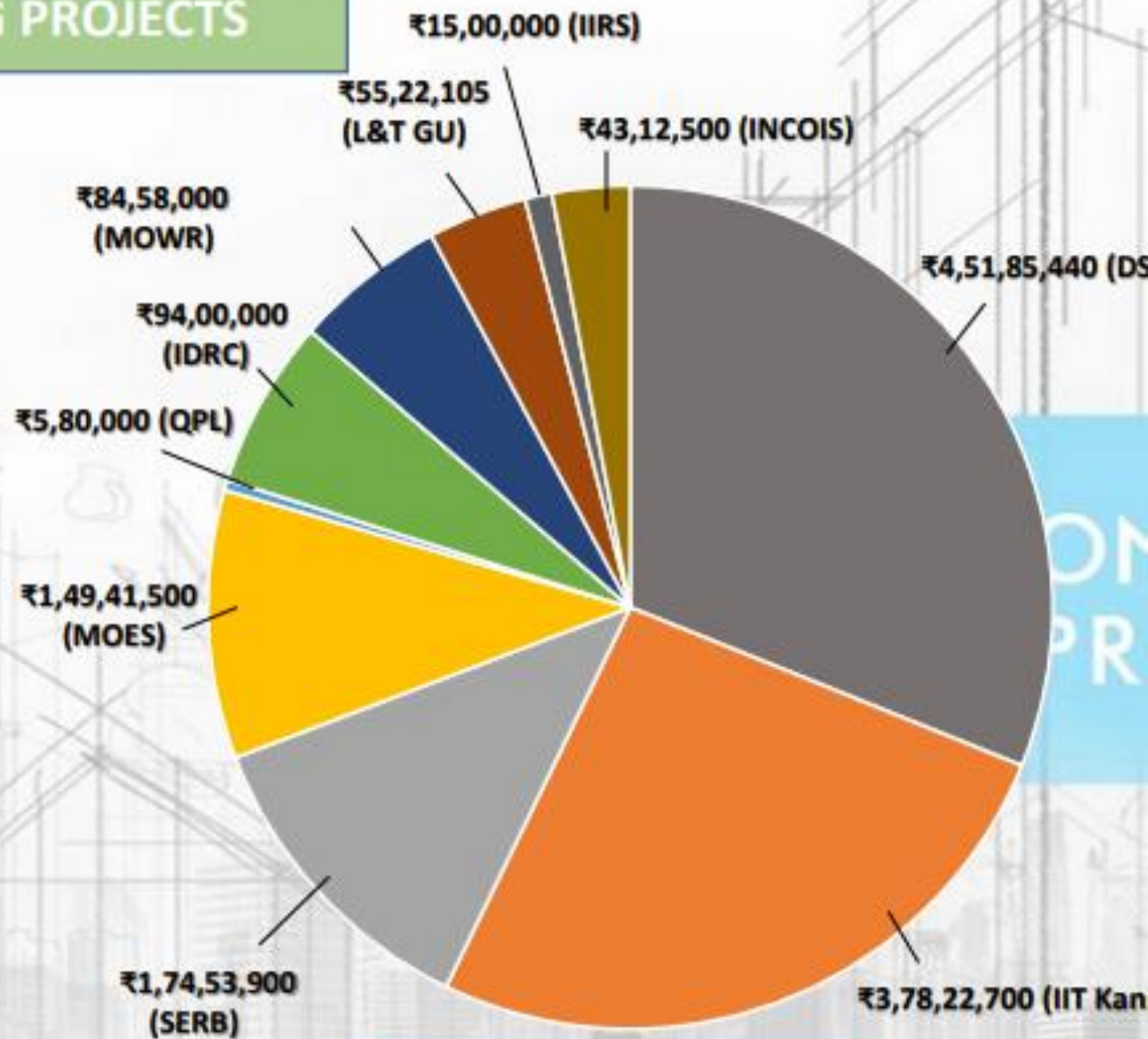
Geophysics projects : Dr. Dibakar Ghosal

Estimation of petrophysical properties of hydrocarbon bearing reservoirs using FAVO analysis (₹47.00 Lakhs)

Modelling of Gas hydrate reservoir using integrated techniques (₹66.00 Lakhs)

Structural Geology : Dr. Santanu Misra

Enhanced Coal-Bed-Methane and Shale-Gas recovery from underground reservoirs aided by permeability enhancement and CO₂ sequestration – an experimental approach. (₹3.17 Crore)



Other Ongoing Projects

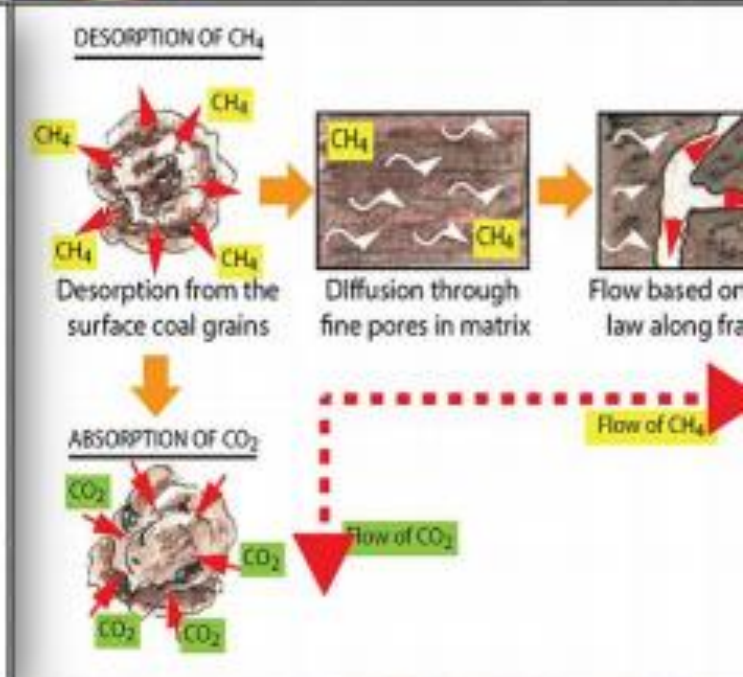
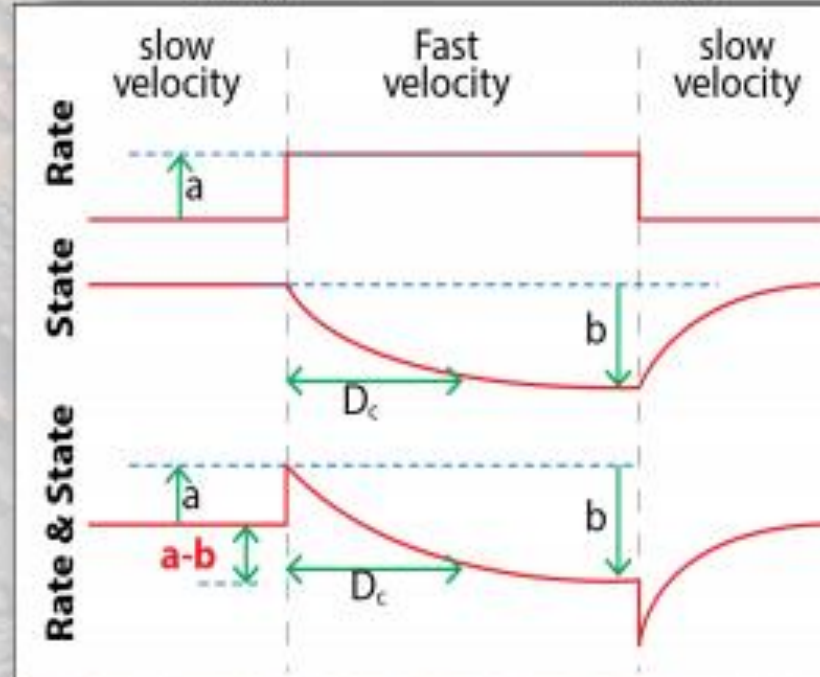
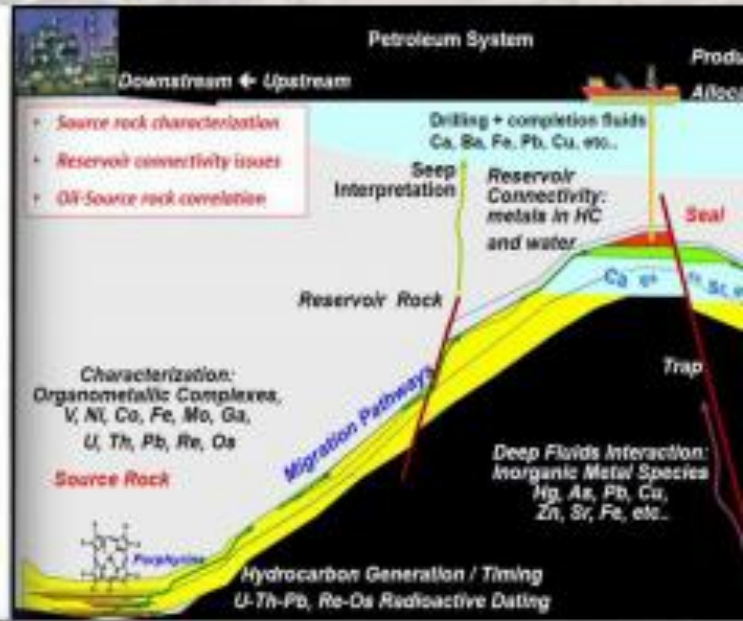
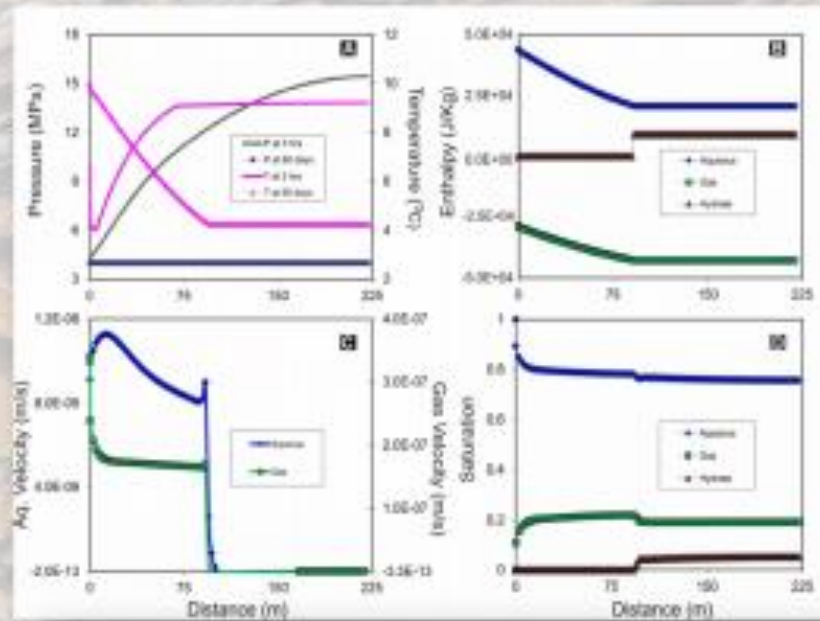
Research Areas

Hydrocarbon Studies:

- Seismic studies on:
 - Gas hydrate reservoirs
 - Poro-elasticity
 - Refraction Tomography
 - Full Waveform Inversion
- Application and development of new inorganic tools in hydrocarbon exploration

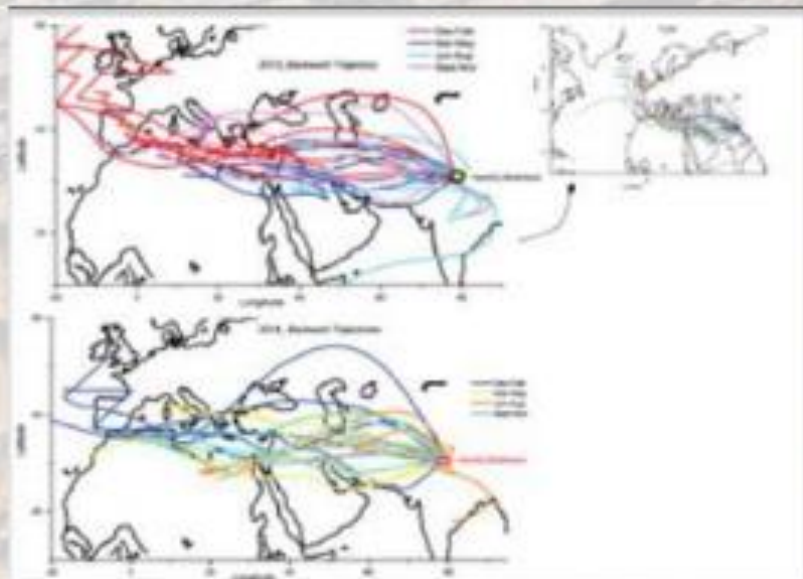
Structural studies:

- Enhanced Coal-Bed-Methane and Shale-Gas recovery from underground reservoirs aided by permeability enhancement and CO₂ sequestration – an experimental approach
- Characterization of the frictional properties and seismic-aseismic transitions in active faults of the Himalaya: an experimental investigation



Geochemical Studies:

- Isotopic evolution of terrestrial reservoirs in open system models of the Earth
- Magnitude and Pathways of Anthropogenic Platinum Group Elements: Emerging Environmental Contaminant in India
- On-Site Detection of Arsenic Fluoride & Hardness in Drinking Water
- Design and Development of Aquatic Autonomous Observatory for In situ Monitoring, Real Time Data Transmission and Web based Visualization



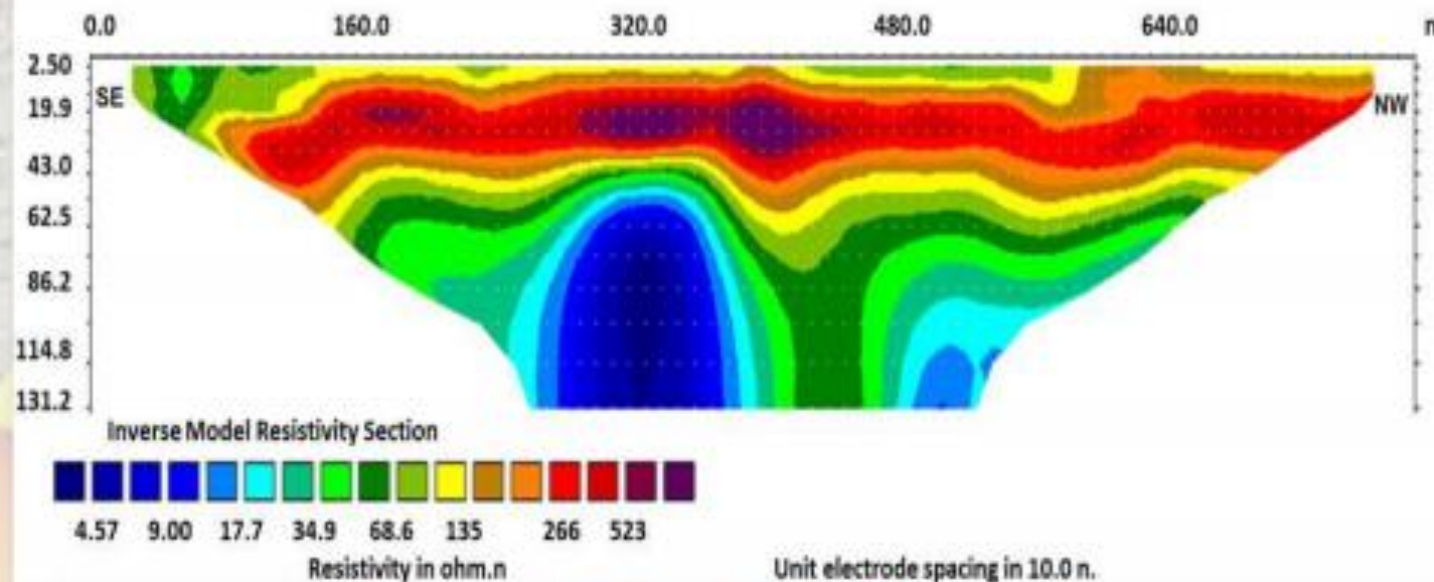
Groundwater Structure and Dynamics

- Geomorphic controls on ground water aquifers-integrated approach using borehole data and modelling
- Forecasting the response of the ground water system to plausible future changes in the water cycle
- Modelling ground water flow dynamics under varying stresses-historical water level data analysis, isotopic methods for source characterization and recharge estimation; ground water modelling

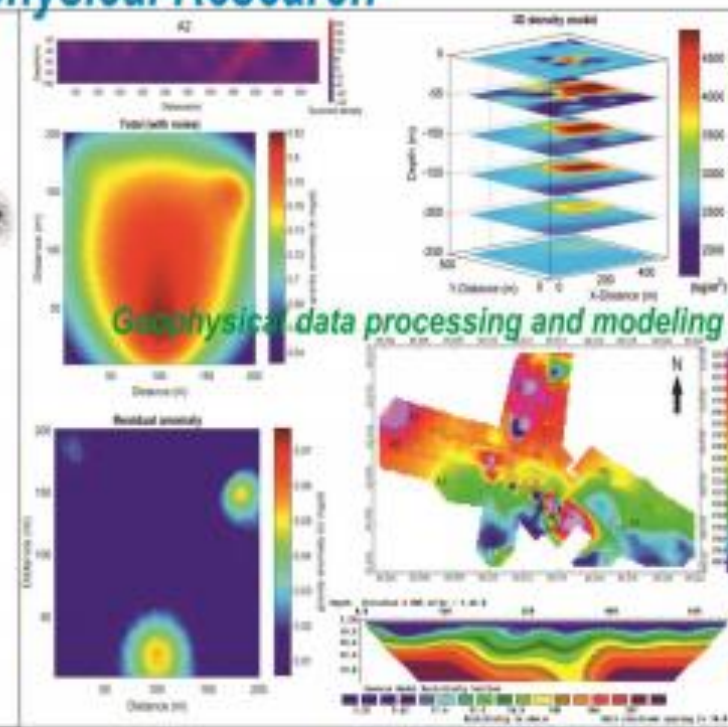
And also some major studies on:

- Potential field methods
- Integrated geophysical research
- Mineral exploration and near surface studies
- Tectonic studies
- Geophysical data processing/enhancement
- Modeling and joint inversion

Depth Iterations 5 RMS error = 6.2 %



Integrated Geophysical Research



Other research areas

Natural Hazards :

- Landslides and slope stability
- River flood risk assessment

Paleo-seismology and Paleo-tsunami study :

- GPS measurement-crustal deformation studies in NW Himalaya
- Paleo-tsunami investigation in Andaman & Nicobar islands

Paleoclimate Reconstruction :

- Paleo climate reconstruction using sedimentary archives

Planetary Studies :

- Aspects related to composition, texture and surface morphology on the Moon and it's plume Enceladus

River Sciences :

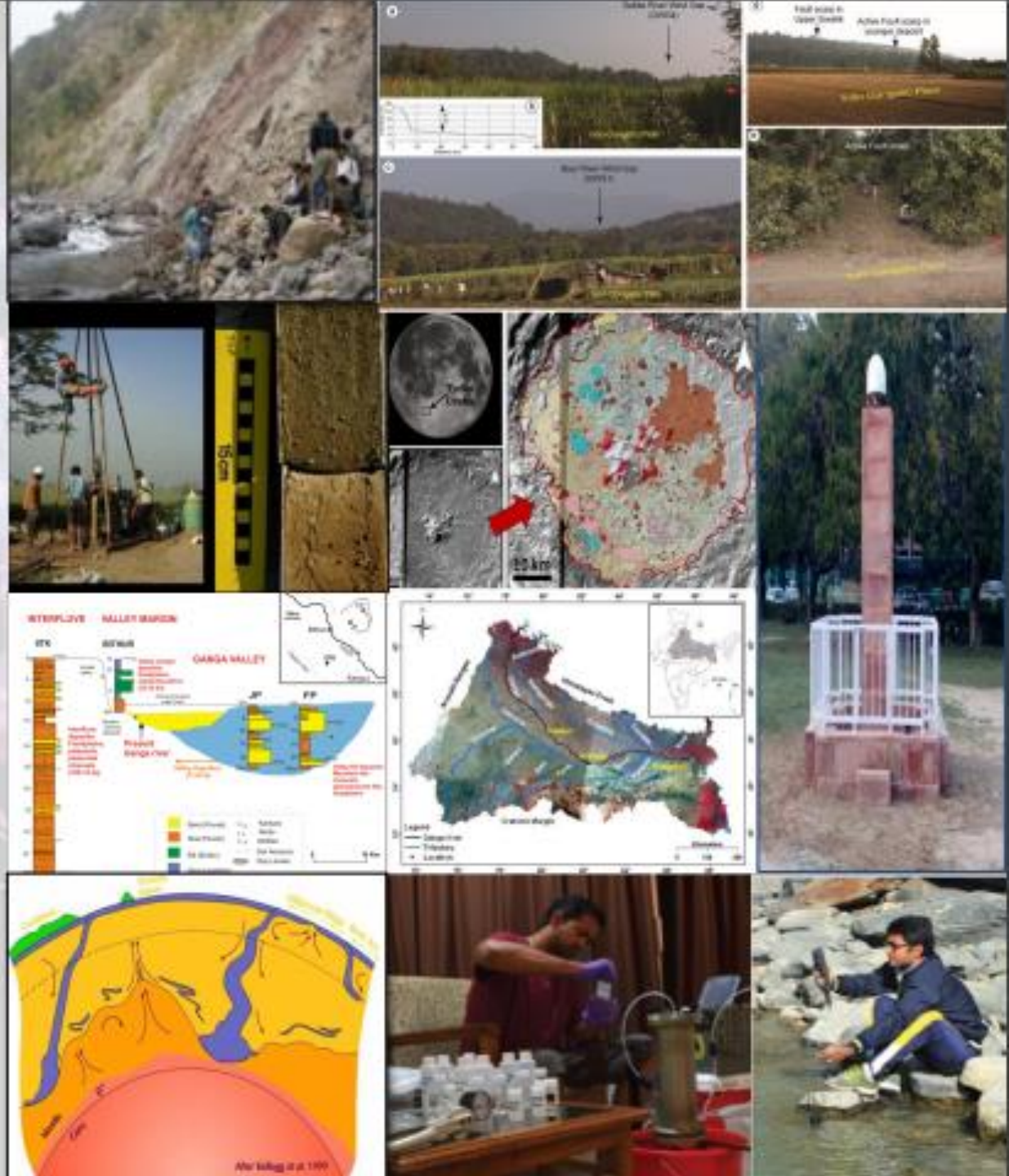
- Human transformations of river system-impact of LULC, anthropogenic interventions and overexploitation on river forms and processes
- Geomorphic features of active tectonics-geomorphic indices, morphometric analysis, Remote sensing and GIS methods

Environmental Sciences :

- Environmental flow and river health assessment

Geochemical Studies :

- Impact of aerosols and Aeolian dust, sea salt spray, soil erosion and volcanic emissions on chemical fluxes on Earth's surface
- Implication for crustal evolution, heat flow and Open system geochemical evolution models



Research facilities

Geophysics lab

- Well Logger
- Seismic Thumper
- Geophones (RAU)
- High Performance Workstation
- Gravimeter
- Magnetometer
- Very Low Frequency
- VES

Other Useful terrain mapping tools such as

- Total station
- DGPS
- UAV
- GPR

Rock Mechanics Lab

- Rock core Drill Machine
- Vacuum Oven
- Pulveriser
- Low speed diamond Saw
- Automatic Rock curring Polishing
- Uniaxial Rock Machine
- Lathe Machine
- Hydraulic Press
- Hydraulic Hot Mountain Press
- Lapping Machine



Sedimentology & Microscopy Facilities

- Sedigraph
- XRD
- Sieve shaker
- OSL Reader
- Isodynamic Magnetic separator
- Ultra-Thin Section bench Top
- SEM
- Vibratory Cup mill
- Vacuum Impregnation Unit
- Thin Section Preparation Unit
- UIC coulometer
- Leica Optical Microscope
- Stereo Zoom Microscope (SMZ 1000)
- Cathode Luminescence Microscope

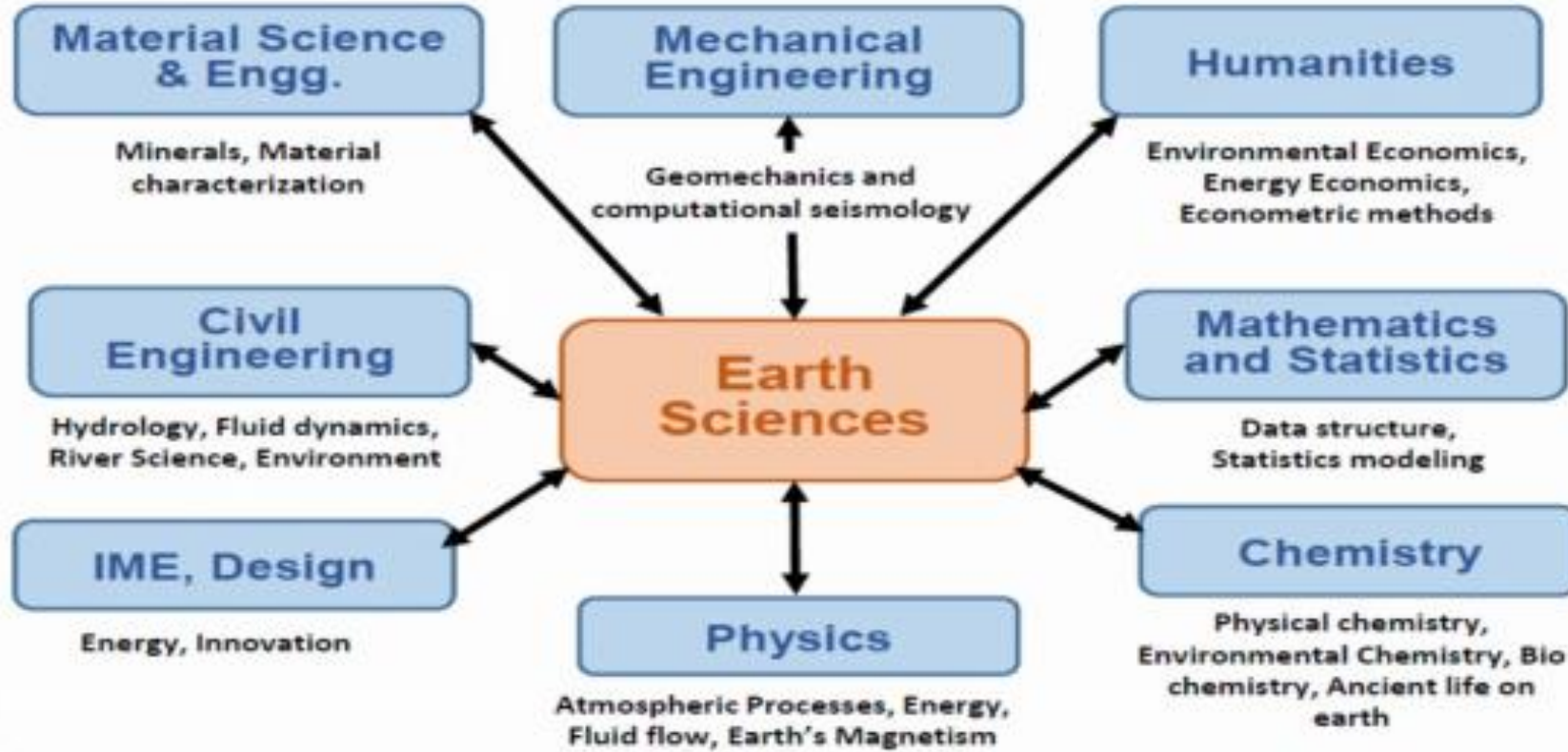


Analytical facilities

- XRF
- Q-ICPMS
- IRMS
- Aerosol Sampler
- Hydraulic Press pellet
- F- AAS
- Core Archival and Analysis Facility
- Core Scanner (DCS)
- Metal- Free clean lab
- Bartington Magnetic Susceptibility Meter- dual Frequency
- Laser Water Isotope Analyzer
- Nutrient Analyzer



Synergy with other Departments



Contact us

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