

# INDIAN INSTITUTE OF TECHNOLOGY BOMBAY

## DEPARTMENT OF EARTH SCIENCES

Following are the research topics, in which, admission for the PhD program will be offered in the Autumn Semester, 2022-23.

1. Robust Estimation of Magnetotelluric Response Function
2. Nonlinear and Adaptive Signal Processing Techniques in Geophysics and Geomagnetism
3. Study of sedimentary rocks interlayered with coal beds for trace element concentrations
4. Assessment of geomechanical risks in CO<sub>2</sub> enhanced oil recovery & storage.
5. Reservoir characterization and numerical modeling of coal reservoir for CO<sub>2</sub> - enhanced coalbed methane recovery.
6. Investigation of flow-deformation attributes of gas hydrate bearing sediments from Krishna-Godavari Basin
7. Mineral carbonation of CO<sub>2</sub>: Geomechanical and geochemical assessment of basalts for permanent carbon storage
8. Integrated Petrophysical and Rock physics modelling of carbonate reservoirs from Mukta field, Western Offshore region
9. Development of machine learning tools and algorithms for modelling geophysical data
10. Crustal magnetic field modelling of Swarm satellite data
11. Mineral exploration using integrated geophysical imaging
12. Laboratory to field-scale geophysical modelling of coastal aquifers and delineation of SGD segments
13. Machine Learning Assisted Deep-Seated Mineral Targeting using publicly available geoscience data
14. High-resolution seismic imaging to decipher the genesis of swarm sequences in Palghar, using low-cost seismographs
15. 3D crustal modelling of the Indian plate using Bayesian inversion
16. Global-scale tomography using a very long period of seismic data
17. High-frequency surface waves imaging at a mineral-deposit scale
18. Emplacement of the Mundwara alkaline plutonic complex, Rajasthan: clues from field relationships and petrological diversity
19. Structure and emplacement of Deccan Trap mafic sills in the Satpura Gondwana Basin, central India  
**Note:** The above two topics require "Extensive geological mapping in both projects, besides laboratory studies"
20. Lithospheric structure beneath the Aravalli-Delhi fold belt
21. Lithospheric structure beneath the Malani igneous province
22. Seismic imaging, inversion and reservoir characterization to assess CO<sub>2</sub> storage potential
23. Tectonics of Ghuneri dome, Gujarat
24. Seismic depositional modelling and seismic stratigraphy of the Cenozoic Cambay basin aimed to assess CO<sub>2</sub> storage

Kumar Hemant Singh

(Dept. PhD Admissions Coordinator 2022-23)