

Dr. Bankim Chandra Mahanta

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Educational Qualification

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| Doctor of Philosophy, Rock Mechanics, IIT Bombay (India) and Monash University (Australia), | 2019 |
| Master of Science, Applied Geology, IIT Bombay, Mumbai, India, | 2014 |
| Bachelor of Science, Geology, North Orissa University, India, | 2012 |

Experience

Assistant Professor, Jul 2020 – May 2023, Department of Geology, Central University of Tamil Nadu, India
Postdoctoral Associate, Dec 2019 – Jun 2020 Department of Civil Engineering, University of Calgary, Canada
Research Associate (Project), Apr 2019 – Nov 2019, Department of Earth Sciences, IIT Bombay, India
Research Associate, Sept 2018 – Feb 2019, Department of Earth Sciences, IIT Bombay, India

Research Interest

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| Geomechanics and Rock Mechanics | Applied Rock Mechanics for Unconventional Energy |
| Fracture Mechanics of Rock | Slope Stability, Landslide |

Details of Publication

A. Journal Article

Published

1. Vishal, V., Rizwan, M., **Mahanta, B.**, Pradhan, S.P., Singh, T.N., 2022. Temperature effect on the mechanical behaviour of shale: Implication for shale gas production. **Geosystems and Geoenvironment**. 1, 100078.
2. Saha, S., Vishal, V., **Mahanta, B.**, Pradhan, S.P., Singh, T.N., 2022. Geomechanical model construction to resolve field stress profile and reservoir rock properties of Jurassic Hugin Formation, Volve field, North Sea. **Geomechanics and Geophysics for Geo-energy and Geo-Resources**. 8, 1-23.
3. **Mahanta, B.**, Vishal, V., Sirdesai, N.N., Ranjith, P.G., Singh, T.N., 2021. Progressive deformation and pore network attributes of sandstone at in-situ stress states using computed tomography. **Engineering Fracture Mechanics**. 252, 107833.
4. **Mahanta, B.**, Ranjith, P.G., Vishal, V., Singh, T.N., 2020. Temperature-induced deformational responses and microstructural alteration of sandstone. **Journal of Petroleum Science and Engineering**. 192, 107239.
5. **Mahanta, B.**, Vishal, V., Ranjith, P.G., Singh, T.N., 2020. An insight into pore-network models of high-temperature heat-treated sandstones using computed tomography. **Journal of Natural Gas Science and Engineering**. 77, 103227.
6. Sirdesai, N.N., **Mahanta, B.**, Ranjith, P.G., Singh, T.N., 2019. Effects of thermal treatment on physico-morphological properties of Indian fine-grained sandstone. **Bulletin of Engineering Geology and Environment**. 78, 883-897.
7. Vishal, V., Chandra, D., Bahadur, J., Sen, D., Hazra, B., **Mahanta, B.**, Tiwari, D., 2019. Interpreting pore dimensions in gas shales using a combination of SEM imaging, small angle neutron scattering and low-pressure gas adsorption. **Energy & Fuels** 33, 4835-4848.
8. **Mahanta, B.**, Singh, T.N., Ranjith, P.G., Vishal, V., 2018. Experimental investigation of the influence of strain rate on strength; failure attributes and mechanism of Jhiri shale. **Journal of Natural Gas Science and Engineering**. 58, 178-188.
9. Vishal, V., **Mahanta, B.**, Pradhan, S.P., Singh, T.N., Ranjith, P.G., 2018. Geologic sequestration of anthropogenic CO₂ for enhanced coalbed methane recovery in Jharia coalfields, India. **Energy**. 159, 1185-1194.

10. Kundu, J., **Mahanta, B.**, Sarkar, K., Singh, T.N., 2018. The Effect of Lineation on Anisotropy in Dry and Saturated Himalayan Schistose Rock Under Brazilian Test Conditions. **Rock Mechanics and Rock Engineering**. 51, 5–21.
11. **Mahanta, B.**, Tripathy, A., Vishal, V., Singh, T.N., Ranjith, P.G., 2017. Effects of strain rate on fracture toughness and energy release rate of gas shales. **Engineering Geology**. 218, 39–49.
12. Singh, P.K., Tripathy, A., Kainthola, A., **Mahanta, B.**, Singh, V., Singh, T.N., 2017. Indirect estimation of compressive and shear strength from simple index tests. **Engineering with Computers** 33, 1–11.
13. Wanniarachchi, W.A.M., Ranjith, P.G., Perera, M.S.A., Rathnaweera, T.D., Lyu, Q., **Mahanta, B.**, 2017. Assessment of dynamic material properties of intact rocks using seismic wave attenuation: An experimental study. **Royal Society Open Science** 4, 170896.
14. **Mahanta, B.**, Singh, T.N., Ranjith, P.G., 2016. Influence of thermal treatment on mode I fracture toughness of certain Indian rocks. **Engineering Geology**. 210, 103–114.
15. **Mahanta, B.**, Singh, H.O., Singh, P.K., Kainthola, A., Singh, T.N., 2016. Stability analysis of potential failure zones along NH-305, India. **Natural Hazards** 83, 1341–1357.
16. Madhubabu, N., Singh, P.K., Kainthola, A., **Mahanta, B.**, Tripathy, A., Singh, T.N., 2016. Prediction of compressive strength and elastic modulus of carbonate rocks. **Measurement** 88, 202–213.

B. Conference Article

1. **Mahanta B.**, Ranjith P G, Singh T N, Vishal Vikram, Duan WenHui, Sazid Mohammed, 2018. Digital rock physics and application of high-resolution micro-CT techniques for geomaterials, in: **International Conference on Geomechanics, Geo-energy and Geo-resources (IC3G)-2018**, Sichuan University, Chengdu, China. Sep. 21 – 24, 2018.
2. **Mahanta, B.**, Sirdesai, N.N., Singh, T.N., Ranjith, P.G., 2017. Experimental Study of Strain Rate Sensitivity to Fracture Toughness of Rock using Flattened Brazilian Disc. **Procedia Engineering, in EUROCK 2017**, Ostrava, Czech Republic. doi:10.1016/j.proeng.2017.05.179. Jun. 20 – 22, 2017.
3. **Mahanta, B.**, Vishal, V., Singh, T., Ranjith, P.G., 2016. Strain Rate Dependency of Fracture Toughness, Energy Release Rate and Geomechanical Attributes of Select Indian Shales, in: **AGU Fall Meeting 2016** San Fransisco, USA. Dec 12 – 16, 2016
4. Sirdesai, N.N., **Mahanta, B.**, Singh, T.N., Ranjith, P.G., 2016. Elastic modulus of thermally treated fine grained sandstone using non-contact laser extensometer, in: **Recent Advances in Rock Engineering (RARE 2016)**. Bangalore, India, pp. 105–109. Nov. 16 – 18, 2016

C. Book Chapter

1. **Mahanta, B.**, Vishal, V., 2020. CO₂ sequestration and enhanced coalbed methane recovery: Worldwide status and Indian scenario, in: De Maio, M., Tiwari, A.K. (Eds.), **Applied Geology: Approaches to Future Resource Management**. Springer. pp 161-181. eBook ISBN: 978-3-030-43953-8.

Simulation/Software Skill

AVIZO, ABAQUS

Professional Skill

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| Image Analysis using Avizo | High pressure and temperature experimentation of rocks |
| Pore network modelling | Permeability evaluation of rocks |
| Experimental fracture mechanics of rocks (mode-I, mixed mode, mode-II) | |

Supervision

| Student Name | M.Sc. Thesis Title | Year |
|-----------------------------|--|-------------|
| Anusmita Mandal | Sorption Behaviour and Pore Characterisation of Coal. | 2022 |
| Bhagyashree Senapati | Slope Stability Assessment Subject to Soil Characteristics in the Chaliyar River Basin of The Western Ghats, South India, Using Geospatial Techniques. | 2022 |
| Priyakshi Borgohain | Hydrocarbon Source-Rock Characterisation of Shales from Assam-Arakan Basin, Assam & Ib River Valley, Mahanadi Basin, Odisha. | 2022 |
| Tapas Ranjan Sahoo | Adsorption Characteristic and Pore Structure Significance for Shale Gas Development. | 2022 |
| Anjana A.P | Quantification of reactive Fe species (Fed & FeOX) and organic bound Sulfur in sediments underlying seasonal oxygen minimum zone of eastern Arabian sea | 2023 |
| Bidhan Chandra Giri | Organic petrographical and geochemical characteristics of lignite-bearing successions from Kapurdi mine (Barmer Basin) western India: Implication to palaeoenvironment, palaeovegetation, depositional settings and thermal maturity | 2023 |
| Dibyajeet Mohapatra | Experimental Investigation into The Controlling Factors for Mechanical Strength and Failure Attributes of Indian Shale for Unconventional Energy Exploration | 2023 |
| Leo Antony | Slope Stability Analysis of road-cut slopes in Mussoorie Region, Uttarakhand, India | 2023 |
| Rakesh Roshan Das | Geochemical and maturity assessment of Giral shale deposits (Barmer basin), Rajasthan, western India | 2023 |
| Samarshree Priyadarsi Sahoo | Comparative study of pore characteristics and adsorption mechanism in Indian shale of different depths | 2023 |
