

## EDUCATION

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### McGill University

*PhD candidate in Earth & Planetary Sciences*

Montreal, Canada

*Sept 2019 - Present*

- Advisor: Prof Christie Rowe, GPA: 4.0
- Thesis Topic: Deep Subduction Zone Dynamics- Insights from the rock record of exhumed subduction zones
- Teaching Assistant: General Geology (221), Terrestrial Planets (180)

### Indian Institute of Technology Bombay

*Masters of Science in Applied Geology, GPA: 9.49/10*

Mumbai, India

*Jul 2016 - Jul 2019*

- PG Diploma in Earth Sciences, 2019, GPA: 9.94/10
- Dissertation: Lateral Variation along Katrol Hill Fault, near Bhuj, Gujarat. Advised by Prof Malay Mukul.
- Teaching Assistant: Structural Geology 413, Paleontology 433, Geology for Civil Engineers

### St. Xavier's College (Autonomous)

*Bachelor of Science in Geology*

Mumbai, India

*Jun 2013 - Jul 2016*

- Cumulative GPA: 3.87, Top of Class

## EXPERIENTIAL LEARNING

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### Canadian Tectonics Group Fieldtrip to Newfoundland & Labrador

*Led By: Prof John Waldron*

*Oct 2019*

- Studied the tectonics of the west Newfoundland Appalachians
- Focused on the evolution of the Laurentian continental margin, obduction of oceanic crustal rocks at Gros Morne National Park, Port-au-Port Peninsula and Table Point

### Inversion Tectonics Mapping Project in Kutch Basin, western India

*Advisor: Prof Malay Mukul*

*Dec 2016, 2017, 2018*

- Structural mapping of extensional and compressional regime fault-related structures
- Observing the effects of fault displacement on topography evolution

### Appalachian Fold-Thrust Belt Fieldtrip

*Advisor: Prof Gautam Mitra*

*May 2017-July 2017*

- Structural mapping and observing the multiple deformation phases that led to the evolution of a fold-thrust belt from the New York to Virginia

### Field Survey and Structural Geology Field Trip to Malvan, western India

*Advisor: Prof H Samant*

*Oct 2015*

- Field survey techniques and analysis of sedimentary deformation structures
- Completed first order interpretation of stress field orientation using gneissosity planes, joint-plane orientation and computed strain using  $R_f - \phi$  method

### Deccan Volcanic Province Field Trip

*Advisor: Prof H Samant*

*Jan 2015*

- Mapped 12 distinct lava flow episodes and zeolite assemblages of the Lohagadh and Khandala Formations along the Western Ghats of India

## OTHER RESEARCH EXPERIENCE

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### **Mineral Prospectivity Mapping for orogenic gold deposits using GIS.**

Advisor: Prof Alok Porval

Jan 2019-May 2019

- Project involved developing a conceptual and GIS model to target the gold deposits within the study area of Arunta region in Australia. We used in-built ArcGIS mineral mapping algorithms (Machine Learning-Neural Network, Weight of Evidence and Fuzzy Logic).
- Analysis included defining the study area, developing a mineral systems approach for targeting the deposit and employing Fuzzy Logic as the mineral mapping model to generate the prospectivity map.
- Based on the analysis, certain areas with higher probability of finding gold ore deposits was identified. The main controls for the mineralization within these areas were fault pathways and distance to source of metal.

### **Lateral Variation in Deformation along the Katrol Hill Fault, Bhuj, Gujarat, India.**

Advisor: Prof. Malay Mukul

Dec 2017-July 2019

- Project included collection of bed orientation data and oriented samples from three N-S traverses along the strike of the Katrol Hill Fault. Analysis included: Stereographic projections, petrographic study and Fry Plot. Based on analysis, certain local variation in attitude of the fault plane and strain was observed.

### **Microstructural study of the Towanda fault zone in the Appalachian Plateau, USA.**

Advisors: Prof. Gautam Mitra

May 2017-July 2017

- Collected samples and data to identify the deformation pattern of the Towanda Fault Zone. Inferred multiple phases of deformation based on overprinting relation of microstructures.
- Supplementary work included: Mapping a particular horse within the fault system and defining the fracture density populations across it. Also observed deformation patterns and stages of deformation along a portion of Northern Appalachians.

### **Optically Stimulated Luminescence (OSL) Dating- Sample Processing and Analysis.**

Advisor: Dr. M Ravi Kumar & Dr. Siddharth Prizomvala

May 2016-June 2016

- Dated Quaternary sediments using OSL method to determine some paleo-seismological uplift rates along a river terrace within the Gujarat basin. Interpreted depositional environments to study paleo-basin characteristics.
- Supplementary work included: Using XRF to determine the concentrations of U, Th, K in the samples and using minimum age model to determine the uplift ages.

## PRESENTATIONS

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1. **Das M**, Boianju I., and Rowe C. (2020) *Chasing the Franciscan megathrust and its implications for Deep Subduction Zone Dynamics: Insights from Angel Island, Franciscan Complex* Poster presented at American Geophysical Union (AGU) Annual Fall Meeting 2020, December 2020.
2. **Das M**, Boianju I., and Rowe C. (2020) *Pillows, Schists, and a lot of Wacke: Subdividing the formerly "coherent" Angel Island Terrane, Franciscan Complex* Poster presented at Geological Society of America (GSA) Annual Fall Meeting 2020, October 2020.
3. **Das M** and Rowe C. (2020) *Deep Subduction Zone Dynamics: Insights from exhumed Subduction Zones* Brown Bag Seminar, McGill University-EPS, Montreal, Canada, April 2020.
4. **Das M** and Mukul M. (2018) *Lateral variation along the Katrol Hill Fault, near Bhuj, Gujarat* Poster presented at International Symposium of the Hiroshima Institute of Plate Convergence Region Research, Hiroshima University, Hiroshima, Japan, Jan 2018.

## HONORS & AWARDS

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1. Awarded the Geological Society of America Grad Student Research Grant (\$1205 USD) (2020-2021)
2. Awarded the Geraldine Davidson Fellowship (\$2500) (2020-2021)
3. Awarded the David Stewart Memorial Fellowship (\$10000) (2019-2020)
4. Awarded the Reinhardt C Fellowship 2 (\$1757) (2019-2020)
5. Awarded the Differential Fee Waiver-waives the international fee, merit-based (\$12,640) (2019-2020)
6. Qualified and secured All India Rank 228 (out of 5795 candidates) in Graduate Aptitude Test in Engineering (GATE) (2018)
7. Institute Academic Prize for securing second highest aggregate in MSc Applied Geology, IIT Bombay (INR 2000). (2017)
8. Awarded the prestigious SN Bose Scholars for a summer internship program to the USA sponsored by WINSTEP Forward, SERB-Government of India and IUSSTF (\$2500 USD). (2017)
9. Awarded the Indian Academy of Sciences Summer Research Fellowship (INR 16000). (2016)
10. Secured an All India Rank 2 (out of 1700 candidates) in Joint Admissions Test for Masters (JAM). (2016)
11. Secured highest aggregate in Geology at the Bachelors of Science level, St. Xavier's College, Mumbai (INR 12000). (2016)
12. Awarded the A.V. Krishnamurthy Award for securing the highest aggregate in Physics at the freshman Bachelors of Science level, St. Xavier's College, Mumbai (INR 7500). (2014)

## INTERNSHIPS

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- University of Rochester, Rochester, NY: Summer Research Intern (2017)
- Institute of Seismological Research, Gandhinagar, Gujarat, India: Summer Research Intern (2016)

## CO-CURRICULAR & OUTREACH

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- Virtual Field Trip Leader, Metro to Monterey Project, McGill University-EPS (2020)
- Outreach Team Member, SMORES: Earth Science Outreach Group, McGill University-EPS (2020)
- Museum Volunteer and Content Developer of Virtual Fossil Trips, Redpath Museum, McGill University (2020)
- Department Representative to Post-Graduate Student Society, McGill University (2019-2021)
- President for Protolith Department Fest, IIT Bombay (2017)
- Literary Arts Coordinator for Post Graduate Cultural Council, IIT Bombay (2016)
- Geology Student Representative to the Board of Studies, St. Xavier's College (2015)
- Vice-President (Management) for Paradigm Science Fest, St. Xavier's College (2015)
- Editorial Board Member for TERRA-Department Magazine, St. Xavier's College (2014)
- Volunteer at Teach for India, Mumbai (2013)

## INDUSTRY EXPERIENCE

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### **TATA Steel Ltd.:Noamundi Iron Ore Mines**

Jharkhand, India

*Mine site trainee*

*Dec 2017*

- Introduced to primary secondary in-situ ore processing systems. Completed training for upstream and downstream processes like extraction of ore, development of mine plans, storage, and dispatch of ore.
- Participated in sample collection and quality control programs within the mines: collection of samples, chemical analysis of samples using ICP-OES, integrating the chemical analysis data using GPS to enable on-site, real-time visualization of chemical data.

### **GMDC: Tadkeshwar Lignite Mines**

Surat, India

*Mine site trainee*

*July 2017*

- Participated in sample collection and quality control programs within the mines. Introduced the various on-site departments of the mining facility: environmental regulation, mine survey, and geology departments.
- Introduced to various mine survey techniques used at this open-pit lignite mine: total survey stations and DATAMINE software to develop monthly mining plans and estimation of reserves.

## SKILLS

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**Programming:** LaTeX

**Remote Sensing GIS packages:** QGIS, ArcGIS, IDRISI, ERDAS Imagine

**Instrumentation:** ICP-AES, XRF, XRD

**Languages:** Bengali (Native), English (Fluent), Spanish (Advanced Beginner DELE A-1), Japanese (Beginner), American Sign Language (Beginner)