

# Pritom Sarma

GRADUATE RESEARCHER · GEOPHYSICS(EARTHQUAKE PHYSICS & SEISMOLOGY)

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## Summary

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I am a graduate student at the Institute of Earth Sciences, Hebrew University of Jerusalem. I graduated with a Masters in Geology from the School of Earth, Ocean and Climate Sciences, Indian Institute of Technology, Bhubaneswar, India. I have a keen interest in computational and data based methods in geosciences. My interests include Flows in Porous Media, Bonded Particle Simulations, Earthquake Physics and Fracture Mechanics. I am currently working on injection induced seismicity, trying to address the problem on why around the world, a large number of induced earthquake are seen around large distances of an injection site over a short period of time, which can't be accounted by any crustal scale hydraulic diffusivity.

## Education

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### Institute of Earth Sciences, Hebrew University of Jerusalem

Jerusalem, IS 9190401

PHD IN GEOSCIENCES

2020 - Pursuing

Specializing in Poromechanics and Earthquake Physics

### Indian Institute of Technology, Bhubaneswar

Argul, Khordha, Odisha, IN 752050

M.SC IN GEOLOGY

2020

8.85 CGPA

Specializing in Earthquake Physics and Fracture Mechanics

## Work Experience

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### Numerical investigations of aseismic slip activated by subsurface fluid injection

SEOCS, IIT Bhubaneswar

MASTERS THESIS

July 2019 - Present

- To investigate the reason why fluid activated aseismic slip is observed around the world in response to subsurface fluid injection
- Ran 1D rupture codes coupled with pore-pressure diffusion to investigate under what parameter space does slip remain aseismic or go dynamic.
- Presently working on introducing poro-elastic enhancement of permeability to the same model.
- Working under the Dr. Pathikrit Bhattacharya of the School of Earth, Ocean and Climate Sciences, IIT Bhubaneswar

### Design and Innovation Centre, IIT Bhubaneswar

IIT Bhubaneswar

AUGMENTED REALITY SANDBOX: FOR TOPOGRAPHIC AND EROSION MODELLING

Jan 2019 - Feb 2020

- Working as Co-PI on a funded project by DIC, IITBBS
- Built codes to convert IR based elevation data and nadir view imagery into a real time topographic monitoring routine applied to a sandbox.
- Project led by Dr. Yengkhom Kesorjit Singh of the School of Earth, Ocean and Climate Sciences, IIT Bhubaneswar

### IASc-NASI-INSA Summer Fellowship 2019

Jadavpur, Kolkata, IN 700032

JADAVPUR UNIVERSITY

May 2019 - July 2019

- Studied the mechanisms of subduction initiation in the early stage of Earth's tectonics, using numerical models and scaling based lab experiments
- Built plane strain based finite element model to show the necessity of pre-existing crustal discontinuities to start a non-spontaneous subduction event.
- Performed scaling based lab experiments to validate the model results
- Worked under Prof. Nibir Mandal, Department of Geological Sciences, Jadavpur University

## Field Experience

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### Ambaji Domain, South Delhi Fold Belt of the Aravalli Craton

STRUCTURAL GEOLOGY AND TECTONICS FIELD

Dec 2018

- Studied and observed the calc-granulite terrains of Ambaji domain, studied multi-generational folding in calc-silicate rocks
- Observed different stages of granulizations associated with the domain, shear zone in such granites
- conducted river basin traverse mapping and S1 contact mapping along a pelitic granulite and calc-granulite terrain
- Guide: Prof. Tapas Kumar Biswal, Department of Earth Sciences, IIT Bombay and Dr. Yengkhom Kesorjit Singh, School of Earth, Ocean and Climate Sciences, IIT Bhubaneswar

## Ajmer-Jodhpur-Sirohi, Rajasthan

ORE PETROLOGY AND STRUCTURAL FIELD

Dec 2019

- Studied the hard rock geology of the Aravalli cratonic block in Rajasthan and the geological settings, P-T conditions and effect of active fluids in ore genesis in this terrane.
- Visited Vedanta HZL- Kayad mines (Pb-Zn SedEx deposit), Degana Tungsten deposit (greisen), Kishangarh Nepheline Syenite
- Studied the Archaean-Proterozoic contact at Jodhpur-the Malani Rhyolites; carried out traverse mapping in the Balda Granite terrain in Sirohi
- Guide: Dr. Sourabh Bhattacharya, School of Earth, Ocean and Climate Sciences, IIT Bhubaneswar

## Sikkim-Darjeeling Himalayas

HIMALAYAN TECTONICS AND GEOLOGY FIELD

Feb 2017

- Observed the occurrence and positions of the MFT, MBT and MCT of the Himalayan Orogen
- Studied the Lower and Middle Siwalik sequences of Kalimpong and Darjeeling Districts of WB, Gondwana Sequences (Buxa Formation) and Ramgarh Thrust Fault
- Studied the Inverse Barrovian Zones of the Daling Group, Rangeet Window and the Lingste Gneissic Complex
- Guide: Dr. Amiya Baruah and Dr. Bibhuti Gogoi, Department of Geology, Cotton University

## Programming Skills & Courses Taken

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### PROGRAMING SKILLS

**FORTRAN**, Numerical Libraries of Intel Fortran, Compiler level optimizations, shared memory multi-core optimizations and the basics of Open MPI

**MATLAB**, Data Handling, Advanced Statistical Analysis, Visualization, Symbolic Math Toolbox, PDE Toolbox and Mapping Toolbox

**C++**, Numerical Routines, Sorting Algorithms, Stacks and Object Oriented Programming

**UNIX Shell**, File Handling, Scripting and Process Handling

### COURSES TAKEN

**Rock Mechanics**, Advanced level credit course on Theoretical Rock Mechanics

*IIT, Bhubaneswar*

**Computational Geosciences**, Graduate Level credit course on Numerical Methods, Geostatistics, Signal Processing and Time Series Analysis with MATLAB applications

*IIT Bhubaneswar*

**Fluid Dynamics**, Intermediate Level Course on Fluids, with applications to earth and atmospheric sciences

*IIT Bhubaneswar*

**Heat and Mass Transfer in Earth System**, Graduate Level Course dealing with heat and mass transfer and its quantification for various geodynamic processes

*IIT Bhubaneswar*

**High Performance Computing in Earth Sciences**, Advanced Level Course dealing with High Performance of optimizations of FORTRAN routines, with respect to its applications to Earth Sciences

*IIT Bhubaneswar*

## Publications & Conferences

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- Sarma, P., & Bhattacharya, P. (2020, 08). Role of permeability enhancement in the growth of injection induced aseismic ruptures. Poster Presentation at 2020 SSEC Annual Meeting (<https://www.ssec.org/meetings/2020/am/poster/141>).
- Sarma, P., & Bhattacharya, P. (2020, 12). Does pore-pressure induced permeability enhancement aid fluid-induced aseismic ruptures outpace pore-fluid migration? AGU Fall Meeting 2020 (Abstract Accepted, Awarded AGU 2020 Student Travel Grant).
- Sarma, P., Bhattacharya, P. & Viesca, R. (2020). Mechanism of aseismic outpacing for pore-pressure induced, permeability enhanced ruptures (Under Preparation).

## Extracurricular Activity

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### Post Graduate Representative

STUDENTS GYMKHANA, IIT BHUBANESWAR

Mar. 2019 - Jun. 2020

- Worked on grievance redressal for PG Student community in IIT Bhubaneswar
- Involved in networking and team building activities in the students gymkhana

### National Level Quizzer

ARTS, ENTERTAINMENT AND TRIVIA

Since 2015

- Represented my university during undergrad in Nationals for AIU Youth Fest Quiz in 2016-17
- Won quiz best team during undergrad in National Graduate Congress, USTM, Meghalaya in 2017 and 2018
- Represented IIT Bhubaneswar in Inter IIT Cult Meet 2018, Spring Fest IITKGP 2020 and Mettle Meet Odisha 2019 with podium finishes
- Represented SEOCS, IIT Bhubaneswar in a National Geoscience and Mining Quiz, attended by all IITs and NITs with mining and geology courses and were awarded the best team amongst all in 2019
- Conducted/researched for 50+ national and state level quizzing competitions during the period of 2016-2020