

# Kaushik Kumar Pradhan

## Curriculum Vitae

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### Education

- 2016–2021 **BS-MS Dual Degree**, Indian Institute of Science Education and Research Kolkata
- Major: Geological Sciences
  - GPA: 8.15 (on a scale of 10)
  - Key Coursework: Seismology, Seismology Lab, Inverse Theory, Geophysics, Structural Geology and Tectonics, Geotechnical Engineering, GIS and Remote Sensing, Linear Algebra, Probability, Computer Programming I and II (Python), Programming and Data Structures I (C)
- 2016 **AISSE, CBSE, Class XII**, Jawahar Navodaya Vidyalaya Pune, 82.0%
- 2014 **AISSE, CBSE, Class X**, Jawahar Navodaya Vidyalaya Boudh, CGPA : 10.0 (on a scale of 10)

### Research Interest

- Crust and Upper Mantle Structure
- Earthquake Source Processes
- Modern Computational Techniques (ML, GPU)
- Integrating Seismology with Geochemistry and Petrology

### Technical Skills

Languages	Python, C/C++, Java, R
OS	Windows, Linux, Mac
Development	HTML, CSS, JavaScript
Seismology	Seismic Analysis Code (SAC), General Mapping Tool (GMT)
Tools	LaTeX, Bash Shell, MATLAB, SQL, Gnuplot, Origin, MS Office
Instruments	XRD, ICP-OES, Zeta Sizer, Spectrophotometer, FT-IR

### Research Experience

- Aug 2020 - Present **Master Thesis Project**, Computational Seismology Lab, IISER Kolkata
- Working on the Lg wave propagation across India and Eurasia.
  - Quantified the efficiency of the Lg propagation in terms of amplitude ratio of regional phases.
  - Generated the tomographic plots of normalized Lg/Sn of the western part of Himalaya.
  - Currently working on the interpretation of the result obtained.
  - Presented on the earthquakes in Pakistan region and details of the 2013 Baluchistan earthquake.
- Jan–July 2020 **Undergraduate Researcher**, Computational Seismology Lab, IISER Kolkata
- Area of Interest - Northwestern-Himalaya, Jammu and Kashmir Region
  - Worked on the high resolution surface wave tomography from ambient seismic noise.
  - Performed the data pre-processing by removing instrument response, mean and trend.
  - Applied band pass filtering, 1-bit normalization and spectral whitening on the noise signal.
  - Extracted the surface wave by cross-correlating the one hour signal and stacking it.
  - Learnt Hermann's software to generate dispersion curves and inversion to get velocity structure.
  - Presented the work and research trends on noise tomography in lab research meeting.
  - Presented on the earthquakes in the Chile region and geology of the Chile seismic gap.

- May–July 2019 **Seismology Research Intern**, Computational Seismology Lab, IISER Kolkata
- Explored the various grand challenges in seismological research and current research areas.
  - Worked on the back-projection technique for the spatiotemporal evolution of the earthquakes.
  - Studied the theory on noise tomography to produce the high-resolution seismic structure.
  - Attended seminars on full-waveform inversion and tectonics of continent-continent collision.
  - Presented on the earthquakes in the Marina island and geology of the island.

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## Fieldwork Experience

- Dec 2019 **Understanding the interplay of climate, tectonics and surface processes**
- Field area - North-Western Himalaya
  - Tried to correlate landscape and the responsible paleo tectonic and climatic factors.
  - Quantified the climatic-tectonic-erosion interactions and consequence on landscape change.
- Nov 2019 **Environmental Geosciences Fieldwork**
- Field area - Kalyani Waste Water Treatment Plant
  - Visited different units of the waste water treatment plant - screening, pumping, aerating, sludge removal, scum removal and chlorination to kill bacteria.
- Dec 2018 **Geological mapping and understanding of structural features**
- Field area - Galudih and Tetuldanga area of Jharkhand, India
  - Prepared the structural map of Galudih based on the the planar and linear features.
  - Combining the dip isogon and joint data, commented on the mechanism of folding.

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## Teaching Experience

- Autumn 2020 **Teaching Assistant**, IISER Kolkata
- Course: Seismology (ES3105) | Class Size - 25.
  - Aggregating questions from the students for smoother functioning of online revision classes.
  - Helping students in problem solving and various other questions.
  - Tracking students attendance and taking feedback from the students for each module.

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## Test Scores

- Joint CSIR - UGC NET - 96.55 Percentile
- Joint Entrance Examination - 98.04 Percentile

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## Scholastic Achievements

- 2020 Institute Merit-cum-Means Scholarship from IISER Kolkata
- 2019 Summer Research Fellowship from Summer Research Program, Kolkata
- 2018 The Chatterjee Group (TCG) Foundation Scholarship from TCG Foundation
- 2014 Certificate of Merit from Central Board of Secondary Education (CBSE), New Delhi
- 2014 Dakshana Foundation Fellowship from Dakshana Foundation

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## Professional Events

- Jun 2020 **Artificial Intelligence for Earth System Science**, Conducted by NCAR, BO, CO,USA
- Learnt the fundamentals of data processing, machine learning and deep learning algorithms, evaluation, and interpretation.
  - Developed hands-on experience with machine learning techniques on real-world Earth System Science datasets.
- Aug 2020 **DES Webinar**, Prof Supriyo Mitra (IISER Kolkata)
- Did coronavirus lockdown reduce seismic noise and improve earthquake detection?

- Dec 2019 **DES Seminar**, Prof. Frederik Tilmann (GFZ Potsdam, Germany)  
 ○ Deep structure, geodynamics and crustal tectonics of the Pamir and Hindu Kush: why there are there deep earthquakes below the Pamir and Hindukush but not the Himalayas?
- Dec 2019 **CCES Seminar**, Prof. Jay Pulliam (Baylor University USA)  
 ○ Crustal structure across the Texas-Gulf of Mexico margin from seismic interferometry (Pg), regional (Pn), and teleseismic (P and SsPmp) constraints.
- July 2019 **DES Seminar**, Dr. Helen Williams (University of Cambridge)  
 ○ Tracing fluid transfer across subduction zones using iron and zinc stable isotopes.
- June 2019 **CCES Seminar**, Prof. Steve Grand (University of Texas Austin, USA)  
 ○ Seismic structure of the upper mantle beneath Eastern Asia from full waveform tomography.
- June 2019 **CCES Seminar**, Prof. Eric Sandvol (University of Missouri, USA)  
 ○ The Nature of Escape Tectonics and Coherent Deformation around the Eastern Himalayan Syntaxis.
- Nov 2017 **Workshop on Cyberspace and Cyber Security**, Conducted by IISER Kolkata  
 ○ The workshop introduced various privacy issues, security issues, attacks and countermeasures in cyberspace.  
 ○ Different aspects of quantum cryptography was introduced and concluded with quantum technology for hacker-free society.
- Dec 2016 **National Science Camp - Vijyoshi**, Conducted by IISER Kolkata, IISc Bangalore and DST  
 ○ Attended three days long science camp about modern research on field ranging from Artificial Intelligence to Molecular basis of life.
- Aug 2016 **Institute Colloquium**, Prof. Cedric Villani (Field Medalist, 2010), Institut Henri Poincare  
 ○ Stability Of Solar System.

## Professional Experience

- Aug 2020– **Volunteer at Alumni Cell**, IISER Kolkata  
 ○ Working on the creation of endowment fund to support teaching, research and scholarships.  
 ○ Scrutinizing the selection of financial instruments and capital allocation strategies.
- Aug 2019 – **Content Curator at E-Cell**, IISER Kolkata  
 Dec 2019 ○ Worked on generating scientific venture contents for the Entrepreneurship Cell.  
 ○ Conducted talks to enable smooth interactions between students and entrepreneurs.
- May – July 2018 **Public Policy Research Intern**, IIM Visakhapatnam  
 ○ Worked on the impact of economic reforms by on the expansion strategies of businesses.  
 ○ Modeled the relationship and proposed economic insights to augment the statistical analysis.

## Professional Affiliations

- Sep 2020 – Student Member at European Geosciences Union (EGU)  
 Aug 2019 – Student Member at Society of Petroleum Engineers (SPE)

## References

**Prof. Supriyo Mitra**, Professor, IISER Kolkata  
 email : supriyomitra@iiserkol.ac.in

**Dr. Kathakali Bhattacharya**, Associate Professor, IISER Kolkata  
 email : kathakali@iiserkol.ac.in

**Dr. Sanjay Kumar Mandal**, Assistant Professor, IISER Kolkata  
 email : sanjaykm@iiserkol.ac.in