Kaushik Kumar Pradhan

Department of Earth, Environmental, and Resource Sciences
University of Texas at El Paso (UTEP)
Email: kpradhan@miners.utep.edu
Phone: +1 (915) 240-3758
Web: Google Scholar | ORCID | LinkedIn | GitHub

Selected Research Highlights

- Developed a joint Bayesian inversion combining H/V spectral ratios and surface wave dispersion to delineate shallow magmatic structure beneath Valles Caldera.
- Applied coda wave sensitivity kernels and decorrelation analysis to monitor hydraulic fractures formed during EGS stimulation.
- Used 3D elastic radiative transfer to quantify intrinsic vs scattering attenuation in geothermal reservoirs.
- Built DAS workflows for Thwaites Glacier datasets to retrieve 1D velocity from active source data.

Education

Jan 2022 – Present	**PhD in Geological Sciences**, University of Texas at El Paso (UTEP) Advisor: Dr. Julien Chaput Expected Graduation: Summer 2026 *Passive seismic imaging of the Valles Caldera magmatic system; scattering based characterization of geothermal fracture networks.*
Aug 2016 – 2021	**BS–MS Dual Degree in Geological Sciences**, Indian Institute of Science Education and Research (IISER) Kolkata, India Advisor: Prof. Supriyo Mitra *Lg attenuation structure of the Jammu & Kashmir Himalaya.*

Technical and Computational Skills

Programming	Python (ObsPy, NumPy/SciPy, xarray), MATLAB, Bash, Tensorflow
Seismic Methods	Ambient noise interferometry, H/V and autocorrelation, coda-wave analysis, MCMC inversion, attenuation modeling, dispersion analysis
Modeling	Radiative transfer modeling, MCMC inversion, DAS data processing
HPC	Linux clusters, parallel workflows, Git/GitHub, workflow automation
Mapping	GMT, PyGMT, ArcGIS
Documentation	LaTeX, Jupyter Notebooks

Awards & Honors

2023–24	NSF geothermal research internships at LBNL (2024) and PNNL (2023).
2022–23	Vernon G. & Joy Hunt Endowed Scholarship in Geology (2022, 2023).
2023	Travel Support: DAS RCN Workshop; GAGE/SAGE Community Workshop.
2022	Outstanding Graduate Poster Presentation (2nd Place) in the department.
2021	AGU Fall Meeting Virtual Student Travel Grant.
2021	CSIR-NET Research Fellowship (India) for PhD.

Journal Publications

Peer-reviewed

1. Agnew, R.S., Pearce, E., Karplus, M., Ranganathan, M., Hoffman, A.O., Hunt, M., Pretorius, A., Shanly, S.E., Beres, M., **Pradhan, K.K.**, and Seldon, Y. (2025). *Active and Passive Seismic Surveys over the*

Grounding Zone of Eastwind Glacier, Antarctica. Seismological Research Letters. Link

2. **Pradhan, K.K.**, Sprinkle, P., Chaput, J., Knox, H., and EGS Collab Team (2025). *Characterizing hydraulic fracture formation during enhanced geothermal system experiments using coda waves. The Leading Edge*, 44(3), 163–169. Link

In Preparation

1. **Pradhan, K.K.** et al., Imaging the Valles Caldera using H/V, autocorrelation, and noise based dispersion.
2. **Pradhan, K.K.** et al., Velocity structure beneath Thwaites Glacier from DAS data.
3. **Pradhan, K.K.** et al., Fracture characterization at the EGS Collab site using active seismic data.
4. **Pradhan, K.K.** et al., Intrinsic vs scattering attenuation at Cape Modern geothermal field.
5. **Pradhan, K.K.** et al., Characterizing Lg attenuation structure of Jammu & Kashmir Himalaya.

Conference Presentations

1. **Pradhan, K.**, Chaput, J., Wilgus, J., & Schmandt, B. (2025). Imaging the Valles Caldera Using H/V and Autocorrelation. IASPEI–IAGA Joint Assembly, Lisbon.
2. **Pradhan, K.**, Sprinkle, P., Chaput, J., Knox, H., et al. (2024). Characterizing Hydraulic Fractures Using Synthetic Seismic Data. IMAGE Conference, Houston.
3. **Pradhan, K.**, Sprinkle, D.P., Knox, H.A., Chaput, J., et al. (2023). Real-time Monitoring of Hydraulic Fractures Using Coda Waves. AGU Fall Meeting, San Francisco.
4. **Pradhan, K.**, Chaput, J.A., Schmandt, B. (2023). Passive Imaging Beneath Valles Caldera. SSA Annual Meeting, Puerto Rico.
5. **Pradhan, K.**, Mitra, S. (2021). Lg Attenuation in the NW Himalaya. AGU Fall Meeting, Virtual.

Professional Experience

2022–Present	**PhD Research Associate, University of Texas at El Paso** Developed Bayesian H/V–dispersion inversion; implemented coda-wave scattering analyses; explored ML-based unsupervised classification literature.
Summer 2024	**Student Affiliate, Lawrence Berkeley National Laboratory** Applied 3D radiative transfer models and quantified intrinsic vs scattering attenuation in Cape Modern geothermal field.
Summer 2023	**Geothermal Intern, Pacific Northwest National Laboratory** Applied coda wave interferometry to study fracture evolution during EGS Collab stimulation; created Python scripts to analyze the data.
2022–2025	**Teaching Assistant, University of Texas at El Paso** Led lab instruction for Principles of Earth Sciences and Geology for Engineers.
2019–2021	**Project Fellow, Indian Institute of Science Education and Research Kolkata** Contributed to crustal attenuation and lithospheric deformation research.

Fieldwork Experience

2022	San Francisco Volcanic Field, AZ — volcanic field mapping and planetary analog field studies (NASA/LPI).
2019	Northwest Himalaya — structural and geomorphic mapping across an active orogenic system.
2018	Singhbhum Craton, India — fold geometry and deformation structure mapping in a Precambrian terrane.