Poulami Roy

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Employment History

2024 – 2026 **Post doctoral research associate** Durham University, Durham, UK.

2019 – 2020 **Teaching assistant.** Indian Institute of Science Education and Research Kolkata, India.

2015 – 2016 **Project assistant.** National Geophysical Research Institute, Hyderabad, India.

Education

2021 – 2024 **Ph.D. Geophysics, University of Potsdam, Germany**
Thesis title: *Lower Mantle Anisotropy due to Plume Generation from Large Low-Shear-Velocity Provinces*

2016 – 2018 **M.Tech. Earth Sciences, Indian Institute of Science, India**
Thesis title: *Constraining mantle viscosity structure using seismic anisotropy data*.

2013 – 2015 **M.Sc. Applied Geology, Presidency University, India**
Thesis title: *Geochemical nature of Granitoids from Singhbhum group as part of Chotanagpur plateau, Purulia, India* .

2010 – 2013 **B.Sc. Geology, Presidency College, Calcutta University, India**

Research Publications

Doctoral Thesis

1. P. Roy, "Lower mantle anisotropy due to plume generation from large low-shear-velocity provinces," Ph.D. dissertation, Universität Potsdam, 2024. URL: https://scholar.google.com/citations?view_op=view_citation&hl=en&user=DLJXzDEAAAAJ&citation_for_view=DLJXzDEAAAAJ:Tyk-4Ss8FVUC.

Journal Articles

1. **P. Roy** and J. van Hunen, "Could sagduction explains early earth tectonics? a geodynamic modelling perspective," 2025, *in prep.*

2. **P. Roy**, B. Steinberger, M. Faccenda, and M. Pons, "Lowermost mantle flow at thermochemical piles constrained by shear wave anisotropy: Insights from combined geodynamic and mantle fabric simulations at global scale," *Geochemistry, Geophysics, Geosystems*, vol. 26, no. 10, e2025GC012510, 2025. URL: https://doi.org/10.1029/2025gc012510.

3. **P. Roy**, B. Steinberger, M. Faccenda, and M. Pons, "Modeling anisotropic signature of slab-induced mantle plumes from thermochemical piles in the lowermost mantle," *Geophysical Research Letters*, vol. 52, no. 10, e2024GL113299, 2025. URL: https://doi.org/10.1029/2024gl113299.

4. B. Steinberger, **P. Roy**, M. Pons, and M. P. Jopke, "Why are plume excess temperatures much less than the temperature drop across the lowermost-mantle thermal boundary layer?" *Journal of Geophysical Research: Solid Earth*, vol. 130, no. 4, e2024JB030111, 2025. URL: https://doi.org/10.1029/2024JB030111.

Conference Proceedings

1. **Roy, P., INVITED TALK**, "Understanding earth from deep mantle to deep time: A geodynamic modelling perspective," in *DES Seminar, IISER Kolkata, Dept. of Earth Sciences, Kolkata, India*, January,2026. URL: https://calendar.iiserkol.ac.in/view_event/1855797/.
2. **Roy, P., INVITED TALK**, "Understanding earth from deep mantle to deep time: A geodynamic modelling perspective," in *Special Seminar, Jadavpur University, Dept. of Geological Sciences, Kolkata, India*, December,2025.
3. **Roy, P.**, Van Hunen, J., Pons, M., and Chakraborty, A., "Lithosphere-mantle interactions and weakening processes in early earth: Implications on the onset of plate tectonics," in *EGU General Assembly (EGU 2025)*, Vienna, Austria, 2025.
4. **Roy, P., INVITED TALK**, "Understanding lower mantle anisotropy from plume generation: Insights from combined geodynamical and seismological approaches," in *ASPECT Virtual User Meeting 2025*, 2025. URL: https://www.youtube.com/watch?v=7Pk0lx7lj6o.
5. **Roy, P.**, Steinberger, B., Faccenda, M., Dannberg, J., and Pons, M., "Exploring the development of shear wave radial anisotropy in the lower mantle due to slab-induced plume generation from large low shear velocity provinces: Implication from a global model with 250 millions of years plate motion history," in *EGU General Assembly (EGU 2024)*, Vienna, Austria, 2024.
6. **Roy, P.**, Steinberger, B., Faccenda, M., Dannberg, J., and Pons, M., "Shear wave radial anisotropy from slab-induced thermochemical plumes in the lower mantle," in *Ada Lovelace Workshop on Numerical Modelling of Mantle and Lithosphere Dynamics (ALW 2024)*, Sète, France, 2024.
7. Steinberger, B., **Roy, P.**, and Pons, M., "Why are plume excess temperatures much less than the temperature drop across the core-mantle boundary?," in *EGU General Assembly (EGU 2024)*, Vienna, Austria, 2024.
8. **Roy, P.** and Steinberger, B., "Modelling of seismic anisotropy in the lowermost mantle with rheologically constrained geodynamic setup," in *EGU General Assembly (EGU 2023)*, Vienna, Austria, 2023.
9. **Roy, P.**, Steinberger, B., Dannberg, J., and Myhill, R., "Investigating the development of shear wave radial anisotropy in the lower mantle triggered by slab-induced plume generation from large low shear velocity provinces," in *German Swiss Geodynamics Workshop (GSGW 2023)*, Haltern am See, Germany, 2023.
10. **Roy, P.** and Steinberger, B., "Modelling seismic anisotropy of earth's lower mantle in a 3d plume geodynamic setup," in *Ada Lovelace Workshop on Numerical Modelling of Mantle and Lithosphere Dynamics (ALW 2022)*, Heviz, Hungary, 2022.

Skills

Languages — Strong reading, writing and speaking competencies for English, Bengali (native)

Coding — ASPECT, ECOMAN, HC, Git, Python, Matlab, Fortran, Paraview, Shell script.

Miscellaneous Experience

Teaching Experience

2024 — **Tectonics and Geodynamics Teaching Assistant, University of Potsdam**, Chapters taught: Origin and Dynamics of mantle plumes, Usage and applications of Paraview in geodynamic models visualization, Evaluation of plume buoyancy flux.

Miscellaneous Experience (continued)

Mentoring / Supervision Experience

2025-26 **Co-supervision of BSc dissertation project, Durham University**: Craton stability and mechanisms of craton collapse using numerical geodynamic modelling with ASPECT.

Reviewing Experience

- Journal of Geophysical Research: Solid Earth, Geology

Awards and Achievements

- **Post-doctoral Fellowship**. Natural Environment Research Council (NERC) funded Post-doctoral fellowship in project VIPER (The Virgin Islands: Petrogenesis of early Earth-like Rocks) (2024-2026).

- **Best Poster Award**. Ada Lovelace Workshops on Modelling Mantle and Lithosphere Dynamics, 2024.

- **DAAD Scholarship for Doctoral Programme**. Awarded by German Academic Exchange Service (2021-2024).

Community Contribution

- Co-convenor (session proposal submitted), EGU 2026: Cratons through time: Geochemistry, Geodynamics and the Evolution of a Habitable Planet ($GD3$).

- Co-organizer, ASPECT Splinter Meeting at EGU 2025, promoting community discussions on the open-source numerical modelling code ASPECT.

- Code development. Contributed updated material files to the ASPECT code, 2025; Implemented rheological modifications in the ASPECT code, 2023. https://github.com/poulamiiroy

Funded project

- Awarded Proposal (Peer-Reviewed) - Project Manager of the computational project **Modelling Shear Wave Seismic Anisotropy from Crust to the Lowermost Mantle** Funded by the NHR@ZIB Center, Alliance for National High Performance Computing (Nationales Hochleistungsrechnen, Germany). Annual computing time allocations received since 2024:

  - 20 million core-hours awarded for 2024–2025,
  - 12 million core-hours awarded for 2025–2026.

  This project is related to my PhD thesis and follow-up publications.

Outreach

- Participated in a media project. Topic: Our planet is seen as an enigmatic mosaic made of dynamic pieces. Ten female scientists unravel some key pieces connected by the Earth's magnetic field, https://www.youtube.com/clip/UgkxVjdsIPoKQUYCijeM4PhYQGodxOYkl95r