

Rishav Mallick
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EDUCATION

- National Institute of Technology Karnataka (NITK), Surathkal
Bachelor of Technology (Chemical Engineering and Technology) 2009-2013
- Indian Institute of Science (IISc), Bangalore
Master of Technology (Earth Science) 2013-2015
- Nanyang Technological University (NTU), Singapore
Doctor of Philosophy 2016-present

RESEARCH INTERESTS

My goal is to understand the physics of the earthquake cycle from the time-scale of our lives (tens of years) to the time-scale over which topography is built (millions of years). I use a variety of satellite data sets: GPS, InSAR, hyperspectral images, DEMs as well as broadband seismic signals to study these processes. I also research the contributions of fault geometry and frictional properties of faults to tectonic strain accumulation; this is important to quantify the seismic hazard in a region. I am currently most interested in continental collision settings i.e the Himalayas and the Indo-Burman collision.

The Indo-Burman ranges and the Sagaing Fault in Myanmar are spectacular features created by the Indo-Burman collision, but the threat in Bangladesh is posed by a “blind” megathrust, which is curiously silent seismically and even incorrectly assumed to be “dead” by many researchers. I work on assessing the strain being accumulated by this silent and potentially deadly fault. A large earthquake on this structure will adversely affect the lives of ~100 million people.

- Modelling interseismic strain accumulation on plate boundaries
- Slow slip and aseismic deformation
- Geodetic imaging of the earthquake cycle
- Numerical modelling of the earthquake cycle
- Geomorphology of fold-and-thrust belts
- Bayesian inverse problems and uncertainty analysis
- Earthquake source seismology

PUBLICATIONS

- **Mallick, R.**, Lindsey, E.O., Feng, L., Hubbard, J., Hill E. M., (2019) Active Convergence of the India-Burma-Sunda plates revealed by a continuous GPS network. *Submitted to Journal of Geophysical Research: Solid Earth*

- Bradley, K., **Mallick, R.**, Alfian, D., Andikagumi, H., ... Yun, S. (2019). Wet Rice Cultivation was the Primary Cause of the Earthquake-triggered Palu Landslides. *Submitted to Nature Geoscience*
- Lindsey, E. O., Almeida, R., **Mallick, R.**, Hubbard, J., Bradley, K., Tsang, L. L. H., et al. (2018). Structural Control on Down-dip Locking Extent of the Himalayan Megathrust. *Journal of Geophysical Research: Solid Earth*, 123(6), 5265–5278. <https://doi.org/10.1029/2018JB015868>
- Almeida, R., Lindsey, E. O., Bradley, K., Hubbard, J., **Mallick, R.**, & Hill, E. M. (2018). Can the Up-Dip Limit of Frictional Locking on Megathrusts be Detected Geodetically? Quantifying the Effect of Stress Shadows on Near-Trench Coupling. *Geophysical Research Letters*. <https://doi.org/10.1029/2018GL077785>
- **Mallick, R.**, Parameswaran, R. M., & Rajendran, K. (2017). The 2005 and 2010 Earthquakes on the Sumatra–Andaman Trench: Evidence for Post-2004 Megathrust Intraplate Rejuvenation. *Bulletin of the Seismological Society of America*, 107(3). <https://doi.org/10.1785/0120160147>
- **Mallick, R.**, & Rajendran, K. (2016). The 2014 M w 6.1 Bay of Bengal, Indian Ocean, Earthquake: A Possible Association with the 85° E Ridge. *Bulletin of the Seismological Society of America*, 106(2), 408–417. <https://doi.org/10.1785/0120150308>
- Parameswaran, R. M., Natarajan, T., Rajendran, K., Rajendran, C. P., **Mallick, R.**, Wood, M., & Lekhak, H. C. (2015). Seismotectonics of the April–May 2015 Nepal earthquakes: An assessment based on the aftershock patterns, surface effects and deformational characteristics. *Journal of Asian Earth Sciences*, 111, 161–174. <https://doi.org/10.1016/j.jseaes.2015.07.030>
- Kurtarkar, S. R., Saraswat, R., Nigam, R., Banerjee, B., **Mallick, R.**, Naik, D. K., & Singh, D. P. (2015). Assessing the effect of calcein incorporation on physiological processes of benthic foraminifera. *Marine Micropaleontology*, 114, 36–45. <https://doi.org/10.1016/j.marmicro.2014.10.001>

CONFERENCES AND PRESENTATIONS

- **Mallick, R.**, Hubbard, J., Lindsey, E.O., Moore, J.D.P., and Hill E. M., Breakup of the Indian craton and rise of the Shillong Plateau. *AGU Fall Meeting 2018*
- **Mallick, R.**, Lindsey, E. O., Almeida, R., Hubbard, J., Bradley, K., Hill, E.M., Life in the stress shadow. *Géosciences Azur*, CNRS, Valbonne, France, 2018
- **Mallick, R.**, Lindsey, E. O., Feng, L., Wang, Y., Almeida, R., Hubbard, J., Bradley, K., Hill, E.M., Probing tectonics with satellite geodesy. *Indian Institute of Science Bangalore*, India, 2017
- **Mallick, R.**, Lindsey, E.O., Feng, L., Hubbard, J., Hill E. M., Interseismic Deformation due to Oblique India-Sunda Collision: Implications for the Arakan Sleeping Giant. *AGU Fall Meeting 2017*
- Almeida, R., Lindsey, E. O., Bradley, K., Hubbard, J., **Mallick, R.**, & Hill, E. M., Geodesy cannot presently detect the up-dip limit of frictional locking on megathrusts. *AGU Fall Meeting 2017*

TECHNICAL REPORTS

- Revathy M. Parameswaran, Kusala Rajendran, Thulasiraman Natarajan, **Rishav Mallick**, C P Rajendran, Matthew Peter Wood: *Learning from the April 25, 2015, Nepal earthquake: Mapping the deformation and site response*. DOI:10.13140/RG.2.1.3873.5524

TEACHING EXPERIENCE

- Teaching Assistant for Graduate level course ES7023/ES0002 (Fundamentals of Data Science in Earth and Environmental Systems Science) at NTU, Singapore from January – April 2019.
- Teaching Assistant for Undergraduate level course ES-2001 (Computational Earth System Science) at NTU, Singapore from August – December 2018.
- Teaching Assistant for Undergraduate level course ES-1003 (Solid Earth) at NTU, Singapore from January – April 2018.
- Teaching Assistant for Undergraduate level course UES-307 (Introduction to Solid Earth) at IISc, Bangalore from January – April 2016.
- Teaching Assistant for Undergraduate level course UES-200 (Introduction to Earth and Environmental Science) at IISc, Bangalore from August – December 2015.

AWARDS & GRANTS

<i>July 2016</i>	Research Fellowship: Earth Observatory of Singapore, Nanyang Technological University (2016-2021)
<i>Jan 2016</i>	Award: Gold Medalist for M.Tech (CEaS batch of 2015), Indian Institute of Science
<i>Aug 2015</i>	Award: Best Student Poster Award for Interdisciplinary Geosciences at AOGS (Asia Oceania Geosciences Summit) - 2015
<i>May 2012</i>	Scholarship: Indian Academy of Science Summer Research Fellowship (IAS-SRF) 2012

IN THE NEWS

Our work linking intraplate earthquakes to buried seismogenic structures in the Indian Ocean was featured in the Indian Institute of Science media center (April 2016)

<http://iisc.researchmedia.center/article/getting-%E2%80%9Cdepth%E2%80%9D-problem-new-insight-may-21-2014-bay-bengal-earthquake>