

Summary CV – Dr Amy Gilligan

Major Research Achievements and evidence of esteem

- h-index: Google Scholar 10; i10-index 10
- Published 16 peer-reviewed papers
- Invited talks at University of Cambridge, Dublin Institute of Advanced Studies
- Keynote speaker: British Seismology Meeting 2019
- Section Editor for Journal of the Geological Society
- Peer reviewed grant applications for NSF and NSERC
- Co-supervise 1 PhD student, 4 students starting Oct 2021: 1 primary (NERC QUADRAT DTP), 3 co-supervisor.
- Lead scouting, installation and servicing of broadband seismometers in Borneo, Cyprus, Canada and USA

Employment History

2020 – present, Lecturer, School of Geosciences, University of Aberdeen

2018 – 2020, Royal Astronomical Society Independent Research Fellow, School of Geosciences, University of Aberdeen

2016 – 2018, Postdoctoral Research Fellow, School of Geosciences, University of Aberdeen

2014 – 2016, Postdoctoral Research Associate, Dept. of Earth Science and Engineering, Imperial College London

Research Interests and Experience

I am a geophysicist who primarily uses seismology to investigate Earth processes and structures. This includes developing seismicity catalogues from local earthquake data and using passive seismic data to understand environmental processes. I invert multiple types of geophysical data to construct models of the interior of the Earth in a variety of tectonic settings, including those where present-day mountain building is occurring (e.g the Himalayas, Tibet, Tien Shan), ancient cratons (e.g Canada) and post-subduction environments (e.g Borneo). These models allow me to investigate the deep processes that shape these environments. I use deep learning methods to develop more efficient workflows for processing large datasets.

Publications

Matchette-Downes, H., van der Hilst, R. D., **Gilligan, A.**, and Priestley, K.F., (2019)

Seismological constraints on the density, thickness and temperature of the lithospheric mantle in southwestern Tibet. *Earth and Planetary Science Letters*, 524, 115719

Ogden, C.S., Bastow, I.D., **Gilligan, A.**, and Rondenay, S., (2019) A Reappraisal of the H-k Stacking Technique: Implications for Global Crustal Structure, *Geophysical Journal International*, 219, 1491-1513 (**Top 10 most shared papers in GJI, 2019**)

Pilia, S., Rawlinson, N., **Gilligan, A.**, and Tongkul, F., (2019) Deciphering the fate of plunging tectonic plates in Borneo, *Eos*, 100, doi:10.1029/2019EO123475

Gilligan, A. and Priestley, K.F., (2018) Lateral variations in the crustal structure of the Indo-Eurasian collision zone, *Geophysical Journal International*, 214, 975–989, doi: 10.1093/gji/ggy172 (**Top 10 most shared papers in GJI 2018**)

Liddell, M.V., Bastow, I.D., Rawlinson, N., Darbyshire, F.A., **Gilligan, A.**, Watson, E., (2018) Precambrian Plate Tectonics in Northern Hudson Bay: Evidence From *P* and *S* Wave Seismic Tomography and Analysis of Source Side Effects in Relative Arrival - Time Data Sets, *Journal of Geophysical Research*, 123, 5690-5709, doi:10.1029/2018JB015473

Liddell, M.V., Bastow, I.D., **Gilligan, A.**, Darbyshire, F.A., Pugh, S., (2017) The Formation of Laurentia: Evidence From Shear Wave Splitting, *Earth and Planetary Science Letters*, 479, 170-178, doi: 10.1016/j.epsl.2017.09.030

- Darbyshire, F.A., Bastow, I.D., Petrescu, L., **Gilligan, A.**, Thompson, (2017) D.A., A tale of two orogens: comparing crustal processes in the Proterozoic Trans-Hudson and Grenville Orogens, eastern Canada, *Tectonics*, 36, 1633-1659, doi:10.1002/2017TC004479
- Petrescu, L., Darbyshire, F. A., Bastow, I. D., Totten, E., and **Gilligan, A.**, (2017) Seismic anisotropy of Precambrian lithosphere: Insights from Rayleigh wave tomography of the eastern Superior Craton, *Journal of Geophysical Research*, 122, 3754–3775, doi:10.1002/2016JB013599
- Gilligan, A.**, Bastow, I.D., Boyce, A., Petrescu, L.P., Liddell M.V., et al., (2016) Peering beneath the Canadian Crust, *Astronomy and Geophysics*, 57(6), 24-27 doi: 10.1093/astrogeo/atw221
- Boyce, A., Bastow, I.D., Darbyshire, F.A., Ellwood, A., **Gilligan, A.**, Levin, V., Menke., W., Subduction beneath Laurentia Modified the North American Cratonic Edge: Evidence from P and S wave Tomography. (2016) *Journal of Geophysical Research*, 121, doi:10.1002/2016JB012838.
- Gilligan, A.**, Bastow I.D. & Darbyshire, F.A., (2016) Seismological structure of the 1.8Ga Trans-Hudson Orogen and its affinity to present-day Tibet. *G-cubed*, 17, doi:10.1002/2016GC006419
- Gilligan, A.**, Bastow I.D., Watson, E., Darbyshire, F.A. et al., (2016) Lithospheric deformation in the Canadian Appalachians: evidence from shear wave splitting. *Geophysical Journal International*, 206(2), 1273-1280 doi:10.1093/gji/ggw207 (**Top 10 most shared papers in GJI, 2016**)
- Petrescu, L., Bastow, I.D., Darbyshire, F.A., **Gilligan, A.**, Bodin, T., Levin, V., & Menke, W., (2016) Three billion years of crustal evolution in eastern Canada: constraints from receiver functions. *Journal of Geophysical Research*, 121, 788–811, doi:10.1002/2015JB012348.
- Gilligan, A.**, Priestley, K.F., Roecker, S.W., Levin, V., & Rai, S.S., (2015), The crustal structure of the western Himalayas and Tibet. *Journal of Geophysical Research*, 120, 3946–3964 doi:10.1002/2015JB011891
- Gilligan, A.**, Roecker, S. W., Priestley, K. F., & Nunn, C. (2014). Shear velocity model for the Kyrgyz Tien Shan from joint inversion of receiver function and surface wave data. *Geophysical Journal International*, 199(1), 480-498.
- Nunn, C., Roecker, S. W., Priestley, K. F., Liang, X., & **Gilligan, A.** (2014). Joint inversion of surface waves and teleseismic body waves across the Tibetan collision zone: the fate of subducted Indian lithosphere. *Geophysical Journal International*, 198(3), 1526-1542.

Selected recent conference presentations

- Gilligan, A.**, Bacon, C. A., Al Sarakhi, H., Rawlinson, N., Cornwell, D. G., Tongkul, F., Pilia, S. (2020) New constraints on seismicity in Eastern Sabah, Malaysia. *AGU Fall Meeting Abstracts 2020*, T014-08 (talk)
- Gilligan, A.**, Cornwell, D. G., Rawlinson, N., Jenkins, J., Camara Mendoza, L. A., Pilia, S., Tongkul, F. (2019) Post-Subduction Tectonics in North Borneo: Constraints on Crustal and Mantle Structure from Receiver Functions. *AGU Fall Meeting Abstracts 2019*, T53B-05 (Talk)

Selected Recent Responsibilities

- University of Aberdeen Physical Sciences and Engineering Ethics Board
- University of Aberdeen MSc Geophysics Admissions and Marketing
- British Geophysical Association Outreach Officer

Selected Public Outreach and Engagement activities

- Virtual and in-person talks and interactive sessions to primary and secondary school pupils
- Talks to community groups including, Girls into Geoscience, Pint of Science Aberdeen, Aberdeen Geological Society, and Dundee Mountain Club
- Interviewed for the Royal Astronomical Society's Supermassive podcast
- Good vibrations seismology stand at University of Aberdeen May Festival
- Interviews on LBC radio about recent earthquakes