Prof. Ana M. G. Ferreira

Contact Information

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Education

DPhil in Seismology, University of Oxford, UK	June 2005
Diploma in Physics Engineering, IST, University of Lisbon, Portugal	Sept 2000
• Final grade: 18/20 (1st class honours equivalent)	
Auditrice in Physics and Geophysics, Ecole Polytechnique, France	June 1999
• Mention: Très honorable	

Employment

Full professor in Seismology, UCL, UK	2021 -
Reader (Associate Prof.) in Seismology, UCL, UK	2015 - 2021
Lecturer (Assistant Prof.) in Seismology, UCL, UK	2013 - 2015
Senior Lecturer in Geophysics, University of East Anglia, UK	2012 - 2013
Lecturer in Geophysics, University of East Anglia, UK	2007 - 2012
Stipendiary Lecturer in Mathematics for Earth Scientists, University of Oxford, UK	2006 - 2007
Postdoctoral researcher, University of Oxford, UK	2005 - 2007
Industrial placement, Schlumberger Cambridge Research, UK	2000

Carear breaks

Maternity leave (6 months), University College London, UK	2019-2020
Maternity leave (6 months), University of East Anglia, UK	2012-2013

Honours

Visiting Professor, IPGP, France	2010 - 2011
Invited UK academic 'Frontiers of Science' Royal Soc. meeting in China	2009
Ex-gratia award for exceptional contribution to the University, UEA	2008
PhD Individual Fellowship, Portuguese Science Foundation (FCT)	2001 - 2005
Merit prize for outstanding academic results (2/cohort), IST, Portugal	2000

Other appointments

External PhD examiner

Univ. Edinburgh (June 2011); Univ. Paris VI (Dec. 2011, Jan. & June 2014; Oct. 2016; Feb. 2018; Apr. 2023); Univ. Granada (Jan. 2014), Univ. Cambridge (March & June 2014; Nov. 2015); Univ. Lisbon (June 2016, Sept. 2020, Dec. 2022); Univ. Lyon (June 2017); Univ. Bergen (March 2018); Univ. Leeds (Nov. 2018); Univ. Chile (Aug. 2020); Univ. Utrecht (Jan. 2022); Univ. Lille (Oct. 2022); Univ. Strasbourg (Nov. 2022); Declined 5 invitations in 2018-2020.

External examiner of teaching programmes

Declined four invitations to serve as external examiner for undergraduate Geophysics programmes in three different UK universities.

External Committees

- Evaluator of French research units for the Haut Conseil de l'évaluation de la recherche et de l'enseignement supérieur (Hcéres), 2019, 2023 (declined)
- External member of the search committee for a new assistant/associate research in marine geophysics, IFREMER, Brest, France 2023 (declined)
- External member of the faculty search committee for a new assistant/associate professorhip in Geophysics, Aarhus university, 2022
- Member of Scientific Advisory Board of the mineral physics group of the UK's Mineralogical Society, 2018-2022
- Evaluator of the Impact of EPOS (European Plate Observing System) seismological services, 2018
- Member of ERC's Pool of Reviewers, 2018-
- Evaluator of H2020 proposals, European Commission, 2017-
- Member of the Scientific Evaluation Committee of the ANR, French national research funding, 2013, 2015-2018

- Member of Scientific Advisory Board, GEOSCOPE, 2016-
- Member of Scientific Advisory Board, Irish Centre Research Appl. Geosc., 2015-2019
- UK representative, administration board of the EU COST Action TIDES, 2015-2018
- Member of NERC's Geophysics & Geodesy Facilities steering committee, 2014-2019
- Member of Scientific Advisory Board, RESIF (French Geophysics Infrastructure), 2012-2016
- Work-package leader (Tomography & Geodynamics) in the EU FP7 project QUEST, 2009-2013
- Member of the Royal Astron. Society (RAS) Geophysics awards committee, 2013
- External REF assessor for Geophysics, University of Ulster, UK, 2013

Conference organisation

- Main organiser of international workshop *Big transition zone: below and beyond*, UCL, May 2017
- Co-organiser of international workshop in earthquake physics, UCL, Sept. 2014
- Convenor of sessions: AGU (2002, 2006, 2008), EGU (2011, 2012, 2018, 2021–23), IASPEI/IUGG (2013, 2018).

Editorial

- Associate editor, Geophysical Journal International, 2016-
- Co-Chief Editor, Physics of the Earth and Planetary Interiors, 2021-

Marine and land expeditions

- Chief scientist, UPFLOW passive seismic experiment in the Azores-Madeira-Canary islands region: recovery of 49 ocean bottom seismometers, Aug-Sept 2022 (5 weeks)
- Chief scientist, UPFLOW passive seismic experiment in the Azores-Madeira-Canary islands region: deployment of 50 ocean bottom seismometers (the largest deployment in the Atlantic to date), Jul-Aug 2021 (4 weeks)
- PI, Deployment and recovery of 6 ocean bottom seismometers from OBIC, UK around São Jorge Island, Azores to respond to a seismic crisis in the region, Aug. 2022 and January 2023
- PI, Deployment and recovery of 10 land seismometers from Seis-UK in the Azores to respond to a seismic crisis in the region, June and November 2022
- Collaborator, Deployment and recovery of one land seismometer in the South Sandwich Islands, Dec. 2022 (PI Dr Emma Nicholson, UCL)

Research grants

- NERC urgency grant: *Mechanics of dyke intrusion in oblique-slip tectonic settings: Unravelling the causes of the March 2022 rare seismic swarm in Sao Jorge Island, Azores*, PI, £100k, 2022-2023
- ERC consolidator grant: *UPFLOW: Upward mantle flow from novel seismic observations*, PI, € 2,843,038, 2021-2026
- NERC large grant: *Mantle Circulation Constrained (MC2)*, co-PI, £2,963,301, 2020-2024
- FCT, Portugal: *SIGHT: SeIsmic and Geochemical constraints on the Madeira HoTspot system*, co-I, € 238,702, 2019-2022
- NERC standard grant: *Earthquake energy budget and coseismic fault temperature from seismological observations*, PI, £382k, 2016-2019
- Marie Curie fellowship: *SAN-ICE: Seismic Ambient Noise as a proxy to investigate ICE in polar regions*, host PI, € 183,454,80, 2018-2020 (declined)
- NERC standard grant: *Investigating mantle mixing and chemical layering through a comprehensive understanding of transition zone seismic discontinuities*, Co-I; PI: A. Song (UCL), £396k, 2017-2020
- NERC standard grant: *Origin of seismic heterogeneity and attenuation in the Earth's upper mantle and transition zone*, PI, £295k, 2014-2017

- FCT, Portugal: *Accurate quantification of regional earthquakes and Earth structure: application to western Iberia*, PI, €120k, 2012-2015
- Alliance, Franco-British Research Partnership grant: *Seismological investigation of large global subduction earthquakes*, UK PI, £3.8k, 2010-2011
- NERC scoping study: *Dynamic Earth Models*, co-I; PI: H. Davies (Univ. Cardiff), £31k, 2012
- Leverhulme Trust: *Probing the Earth's deep mantle with multiscale seismology and geodynamics*, PI, £140k, 2010-2013
- EU FP7 ITN QUEST: *Quantitative estimation of Earth's seismic sources and structure*, co-PI, £238k, 2009-2013
- Royal Society seed grant: *Deep mantle anisotropy*, PI, £15k, 2007-2008

PhD student supervision

- K. Harris (Main supervisor). *Anisotropic tomography of the Azores-Madeira-Canaries region.* Funding: UCL 2022-
- A. Saoulis (Co-supervisor). *Accelerated earthquake source inversions using machine learning.* Funding: STFC's CDT in Data intensive Science (UCL) 2022-
- M. Desiderio (Co-supervisor). *The Seismic Signals of the Heterogeneous Earth Mantle.* Funding: UCL 2020-
- F. Rappisi (Co-supervisor). *Propagating seismic waves through geodynamical models.* Funding: ERC 2019-2022
- A. Marignier (Main supervisor). *From Dark Matter to the Earth's Deep Interior* Funding: STFC's CDT in Data intensive Science (UCL) 2018-2022
- W. Sturgeon (Main supervisor). *Global imaging of seismic attenuation.* Funding: NERC's London DTP 2017-2021
- E. Kendall (Main supervisor). *Seismic anisotropy and geodynamical implications.* Funding: NERC's London DTP. Now teaching fellow, UCL 2016-2020
- T. Perez (Co-supervisor). *Effects of topography on wave propagation in Chile.* Funding: Chilean government 2015-
- M. Frietsch (Main supervisor). *Seismo-geodesy analysis of earthquakes and 3-D structure.* Funding: Impact UCL. Now permanent researcher, Univ. Karlsrhue, Germany 2014-2018
- A. Berbellini (Co-supervisor). *Crustal structure from Rayleigh wave ellipticity.* Funding: Italian government. Now Researcher, INGV, Italy. 2014-2016
- A. Domingues (Co-supervisor). *Tomography of the East African rift in Mozambique.* Funding: FCT, Portugal. Now data scientist, USA 2012-2016
- J.-A. Comino (Co-supervisor). *Popperian analysis of earthquake ruptures.* Funding: Spanish gov. Now PDRA, GFZ Potsdam 2012-2015
- L. Parisi (Main supervisor). *Full waveform modeling of global Earth structure.* Funding: UEA & EU-FP7 QUEST. Now PDRA, KAUST 2011-2015
- K. Lentas (Main supervisor). *Earthquake source inversions using long-period seismic data.* Funding: EU-FP7 QUEST. Now seismologist, ISC 2010-2013
- J. Weston (Main supervisor). *Source inversions using InSAR and long-period seismic data.* Funding: NERC. Now senior seismologist, ISC 2009-2013

Postdoctoral supervision

- Dr. S. Hicks (Main supervisor). *Novel observable design algorithms using ocean bottom seismometer data.* Funding: ERC 2022-
- Dr. M. Tsekhmistrenko (Main supervisor). *Analysis of ocean bottom seismometer data and body wave tomography.* Funding: ERC 2021-
- Dr. W. Sturgeon (main supervisor). *Global anisotropy tomography using Monte Carlo methods.* Funding: MC^2 2022-
- Dr. G. Jones (Co-supervisor, with B. Kulessa, Univ. Swansea). *Imaging crustal structure in Greenland.* Funding: EU Marie Curie - Wales fellowship 2018-
- Dr. M. Frietsch (Main supervisor). *Quantification of global earthquakes: multiple fault models* Funding: NERC. Now permanent researcher, Univ. Karlsrhue, Germany 2018-2019
- Dr. A. Berbellini (Main supervisor). *Quantification of global earthquakes: energy budget and coseismic fault temperature.* Funding: NERC. Now Researcher, INGV, Italy 2016-2018

- Dr. L. Schardong (Main supervisor). *Imaging Earth structure with seismic surface wave amplitudes.* Funding: NERC.
  Now PDRA, Univ. Tel Aviv, Israel 2014-2017
- Dr. J. Attanayake (Main supervisor). *Crustal structure of Portugal from Rayleigh wave ellipticity.* Funding: FCT. Now PDRA, Muenster University 2012-2015
- Dr. S.-J. Chang (Main supervisor). *Global imaging of radial anisotropy.* Funding: Leverhulme. Now assistant professor, Kangwon University, S. Korea 2011-2013
- Dr. D. Kurrle (Co-supervisor, with H. Igel, Univ. Munich). *Long-period analysis of rotational motions.* Funding: German government.
  Now seismologist in German seismic monitoring agency. 2009-2010

MAJOR COLLABORATIONS (EXCLUDING INTERNAL PROJECT COLLABORATIONS)

- **Marine seismology - lead of UPFLOW's working group:** Miguel Miranda (Univ. of Lisbon, Portugal), Chris Bean (DIAS, Ireland), Roberto Cabieces Diaz (ROA, Spain), Mafalda Carapuço (IPMA, Portugal), Carlos Corela (Univ. of Lisbon, Portugal), Wolfram H. Geissler (AWI, Germany), Katrina Harris (UCL), Stephen Hicks (UCL), Kasra Hosseini (UCL), Kuan-Yu Ke (GFZ, Germany), Frank Krüger (Univ. Potsdam, Germany), Dietrich Lange (GEOMAR, Germany), Afonso Loureiro (Univ. of Lisbon, Portugal), Augustin Marignier (ANU, Australia), Marta Neres (IPMA, Portugal), Theresa Rhein (Univ. Potsdam, Germany), David Schlaphorst (Univ. of Lisbon, Portugal), Frederik Tilmann (GFZ, Germany), Maria Tsekhmistrenko (UCL, UK)
- **Earthquake source studies:** Dr. Martin Vallée and Dr. Eric Clévédé, Institut de Physique du Globe de Paris, France; Prof. Gareth Funning, Univ. California Riverside, USA; Prof. Hiroo Kanamori, California Institute of Technology, USA; Prof. Stefan Nielsen, Univ. Durham, UK; Prof. Daniel Stich, Univ. Granada, Spain
- **Seismic tomography and geodynamics:** Prof. João Fonseca, Instituto Superior Técnico, Portugal; Prof. Graça Silveira, Univ. Lisbon, Portugal; Prof. Andrea Morelli, INGV and Univ. Bologna, Italy; Prof. Jeroen Ritsema, Univ. Michigan, USA; Prof. Sung-Joon Chang; Kangwon Univ., South Korea; Prof. Manuele Faccenda, Univ. Padova, Italy; Prof. Miguel Miranda and Fernando Carrilho, IPMA, Portugal; Prof. Anne Davaille, Univ. Paris Sud, France
- **Modelling of non-conventional signals (rotations, strain, noise):** Prof. Heiner Igel, Ludwig-Maximilans- University of Munich, Germany; Dr. Walter Zurn, Black Forest Observatory, Germany

MEMBERSHIPS

- American Geophysical Union
- European Geosciences Union
- Royal Astronomical Society, UK
- Associate researcher, CERIS, IST, Portugal
- Founding member of UCL's Seismological Laboratory
- Fellow of the Higher Education Academy, UK

TEACHING ACTIVITIES

- Module organiser and lecturer: Seismology II (12 weeks), Geophysics Field Methods (12 weeks), University College London, UK 2014-
- Module contributor: MSc Geophysical Hazards Field Course (1 lecture), University College London, UK 2022-
- Contributor to: Seismology I (1 week; 2014-2016); Numerical methods (1 week; 2015-2019). Overseeing 1st year Matlab course (2015-2020), University College London, UK 2014-
- Module contributor: Introduction to Environmental Science (2 weeks) and Modelling Environmental Processes (2 weeks), University of East Anglia, UK 2007-2012
- Module organiser and lecturer: Solid Earth Geophysics (12 weeks) and Solid Earth Geophysics fieldcourse (1 week), University of East Anglia, UK 2007-2012
- Supervisor of BSc and Masters student final research projects (1-4 students/year) and of independent Geosciences report (1 student/year), University College London, UK (2014-) and University of East Anglia, UK (2007-2012)

- Module organiser and lecturer (12 weeks): Supplementary Mathematics for Earth Scientists, University of Oxford, UK 2006-2007
- Tutor in Geophysics and Mathematics for Earth Scientists (2-5 hrs/week), University of Oxford, UK 2001-2007

Institutional responsibilities

- Athena Swan lead, University College London, UK 2023-
- Chair of syllabus committee, University College London, UK 2018-2023
- Member of REF committee, University College London, UK 2018-
- EDI/Athena Swan committee, University College London, UK 2018-
- Coordinator of Global Geophysics seminars, University College London, UK 2018-
- Mentor of one Royal society fellow (2018) one new faculty member 2018-2020
- Member of faculty recruitment panels, University College London, UK 2015, 2018
- Member of Athena SWAN working group, University College London, UK 2014-2019
- Director of geophysics programmes, University of East Anglia, UK 2010-2013
- Member of graduate affairs committee, University of East Anglia, UK 2010-2013
- Member of equipment committee, University of East Anglia, UK 2009-2010
- Member of equipment committee, University of East Anglia, UK 2008-2010

Engagement activities and institutional citizenship

- Development of children's participation in the 2021 and 2022 *UPFLOW* marine seismology expeditions in the Atlantic, including zoom calls to primary schools from the open ocean, instrument naming and drawing by children and writing creative fiction stories inspired by the expeditions
- Development of an animated movie on earthquakes aimed at the general public (in progress)
- Development of *Build your planet* webtool for A-level students
- Workshop with school teachers, in collaboration with the Teacher Scientist Network
- Invited speaker at the Festival of Geology, UK's geologist association, 2018
- Regular workshops for school children and teachers and taster classes
- Sustained proactive contribution to departmental recruitment and social and widening participation activities

Publication summary

- 68 peer-reviewed publications including 2 in review and two invited review papers in Tectonophysics (as of September 2023)
- Full list can be found at ResearchGate or at Google scholar or at https://www.ucl.ac.uk/earth-sciences/people/academic/dr-ana-ferreira
- 62 co-authors from 15 countries.
- My publications focus on the study of deep Earth structure and earthquake source processes to obtain an integrated understanding of the processes controlling the dynamic behaviour of our planet from the surface down to the lowermost mantle.
- Several of my papers present and use novel comprehensive methodologies for modelling seismic and geodetic data. Moreover, I have also published innovative interdisciplinary interpretations of seismic images using geodynamical and mineral physics.
- These publications reflect the breadth of my research as well as my leadership. I am the main senior leader of the majority of my publications (being either first author or having my PhD students/postdocs as first author), having designed, performed and closely supervised the research work.

Ten representative publications (a star denotes a PhD student or postdoc):

1. *Turner, A.R., Ferreira, A.M.G., *Berbellini, A., Brantut, N., Faccenda, M., *Kendall, E., 2022. Across-Slab Propagation and Low Stress Drops of Deep Earthquakes in the Kuril Subduction Zone. Geophysical Research Letters, 49 (16), doi:10.1029/2022GL098402.

2. *Jones, G.A., Ferreira, A.M.G., Kulessa, B., Schimmel, M., *Berbellini, A., Morelli, A., 2021. Uppermost crustal structure regulates the flow of the Greenland Ice Sheet. Nature Communications, 12 doi:10.1038/s41467-021-27537-5.

3. Ferreira, A.M.G., Faccenda, M., *Sturgeon, W. & *Schardong, L., 2019. Ubiquitous lower-mantle anisotropy beneath subduction zones. Nature Geosci., doi:10.1038/s41561-019-0325-7.

4. *Schardong, L., Ferreira, A.M.G., *Berbellini, A. & *Sturgeon, W., 2019. The anatomy of uppermost mantle shear-wave speed anomalies in the western U.S. from surface-wave amplification. Earth and Planetary Science Letters, 528, 115822.

5. *Chang, S.-J. & Ferreira, A.M.G., 2019. Inference on water content in the mantle transition zone near subducted slabs from anisotropy tomography. G3: Geochemistry, Geophysics, Geosystems, 20 (2), 1189- 1201.

6. *Parisi, L., Ferreira, A.M.G. & Ritsema, J., 2018. Apparent splitting of S waves propagating through an isotropic lowermost mantle. J. Geophys. Res., doi:10.1002/2017JB014394.

7. *Chang, S-J, Ferreira, AMG & Faccenda, M., 2016, Deep mantle interaction between the Samoan plume and the Tonga-Kermadec slabs, Nature Communications, 7, 10799, doi:10.1038/ncomms10799.

8. *Chang, S.-.J., Ferreira, A.M.G., Ritsema, J., van Heijst, H.J. & Woodhouse, J.H., 2015. Joint inversion for global isotropic and radially anisotropic mantle structure including crustal thickness perturbations. J. Geophys. Res., doi:10.1002/2014JB01182

9. *Weston, J, Ferreira, AMG & Funning, GJ, (2011). Global compilation of InSAR source models: 1. Comparisons with seismic catalogs. Journal of Geophysical Research, 116. B08408, 2011.

10. Ferreira, AMG, Woodhouse, JH, Visser, K & Trampert, J, (2010) On the robustness of global radially anisotropic surface wave tomography. Journal of Geophysical Research, 115 (B4). ISSN 0148-0227.

Invited talks

Over 60 invited presentations in international conferences, workshops and institutes worldwide. For brevity, here are listed the main presentations in the past 5 years. Note that I declined > 5 invited talks in the past 5 years due to a heavy workload.

- Invited talk, JAMSTEC, Japan 2023
- Invited talk, IUGG meeting, Berlin, Germany 2023
- Invited talk, DEPAS instrumental pool advisory board, AWI, Germany 2023
- Invited lecture, SPIN ITN workshop, Pitlochry, Scotland, UK 2023
- Departmental seminar, University of Liverpool UK 2023
- Departmental seminar, University of Cambridge UK 2023
- Invited talk, workshop *Global Scale Seismic Imaging and Dynamics of the Earth's Mantle*, College de France, Paris, France 2021
- Invited keynote talk, *International Meeting 40 Years of the 1980 Azores Earthquake: a Week of Reflection*, Terceira island, Azores 2020
- Invited talk, Faculdade de Ciências Universidade de Lisboa 2020
- Invited talk, AGU fall meeting, San Francisco, USA 2019
- Invited talk, workshop on *Data needs*, Potsdam, Germany 2018
- Invited talk, AGU fall meeting, Washington, USA 2018
- Invited talk, SEDI meeting, Edmonton, Canada 2018
- Invited keynote talk, EPOS workshop, Lisbon, Portugal 2017
- Invited talk, workshop *Emerging Applications of Data Assimilation in the Geosciences*, Lorentz institute, the Netherlands 2017

- Departmental seminar, University of Leicester, UK 2017
- Departmental seminar, University of Lille, France 2017
- Invited talk, 3rd TIDES workshop *Seismic tomography and uncertainties*, UK 2017
- Invited talk, session *Anisotropy from crust to core*, EGU Meeting, Austria 2017
- Departmental seminar, University of Lyon, France 2016
- Invited talk, workshop *Big Data in Geoscience*, Alan Turing institute, UK 2016
- Invited talk, International Symposium *Flow in the Earth's mantle*, Collège de France, Paris 2016

MEDIA COVERAGE

- BBC article on UPFLOW by science journalist Jonathan Amos, 2023
- BBC world news TV coverage of UPFLOW, 2023 (over 385k visualisations)
- BBC Inside Science Radio 4 program coverage of the UPFLOW project, 2023 (starting at 16:56)
- Interviews for the BBC World News radio programs "Newsroom" and "Newsday" about the UPFLOW project, 2023
- Geology bites podcast, 2022
- Sky News coverage of the UPFLOW project., 2021
- Central, 4-page coverage of the UPFLOW project in the main Portuguese newspaper "Publico" by science journalist Teresa Firmino, 2021
- Eos editor's highlight by editor Bjarne Almqvist on JGR paper by Faccenda, Ferreira et al., 2019

LANGUAGES

Portuguese (mother tongue), English (fluent), French (fluent), Spanish (good level).