KEITH PRIESTLEY

University of Cambridge
Department of Earth Sciences
Bullard Laboratories
Madingley Road
Cambridge CB3 0EZ

Tel: 01223 337195
Fax: 01223 360779
e-mail: kfp10@cam.ac.uk

Education/Qualifications:

B.S., University of Washington, 1969 – Oceanography
B.S., University of Washington, 1969 – Geophysics
M.S., University of Washington, 1971 – Geophysics
Ph.D., University of Nevada, 1974 – Geophysics

Professional History:

2018 Emeritus Professor of Seismology, Department of Earth Sciences, University of Cambridge
2018 Life Fellow, Queens' College, Cambridge
2009 Professor of Seismology, Department of Earth Sciences, University of Cambridge
2006 Reader, Department of Earth Sciences, University of Cambridge
2005 Visiting Professor, GeoForschungsZentrum, Potsdam, Germany
2004 Senior Lecturer, Department of Earth Sciences, University of Cambridge
2003 Lecturer, Department of Earth Sciences, University of Cambridge
2001, 2003, 2006, 2007 Visiting Professor, Université Louis Pasteur, Strasbourg, France
2000 CNRS Visiting Professor, LGIT, Université Joseph Fourier, Grenoble, France
1991 Assistant Director of Research, Department of Earth Sciences, University of Cambridge
1991–2018 Fellow, Queens' College, Cambridge
1990–95 Research Seismologist, Seismological Laboratory, University of Nevada, Reno
1987 Professor of Geophysics, Seismological Laboratory, University of Nevada, Reno
1984 Associate Professor, Seismological Laboratory, University of Nevada, Reno
1982 Senior Lecturer, Department of Geology, University of Otago, Dunedin, New Zealand
1980 Lecturer, Department of Geology, University of Otago, Dunedin, New Zealand
1979–86 Visiting Research Associate, IGPP and Scripps, UC San Diego
1976–79, 1982–84 Assistant Professor, Seismological Laboratory, University of Nevada, Reno
1974-75 Visiting scholar, Dept Geodesy and geophysics, University of Cambridge

Research:

My research focuses on the structure and mechanical behaviour of the Earth's crust and upper mantle. I use seismology to construct images of the internal structure of the Earth which can then be used to test hypotheses of the Earth's evolution and dynamics. Although my research has depended heavily on publicly-available seismic data, much of my work is based on data collected in my field experiments in Iceland, New Zealand, Hawaii, Greece, Turkey, Chile and much of the Middle East and central Asia. I combine my seismic results with advances in geochemistry, petrology, and mineral physics to relate the measured seismic wave speeds to temperature and composition. This has allowed me to produce thickness maps of the lithosphere, the cold boundary layer near the Earth's surface which controls the Earth's heat loss and the tectonics of the oceans and continents. These lithospheric maps show how extensive regions of thick lithosphere have controlled the geometry of continental deformation; they have also provided significant new insights on the formation and evolution of the continents.

Current research focus:

- Mapping upper mantle velocity and anisotropy with large surface wave data sets [8,1,11]
- Relationship between upper shear-wavespeed, temperature and rheology of the upper mantle [6,7]
- Structure of the lithosphere and its influence on the evolution of the continents [2,3,13]
- Lithospheric-scale processes of the Arabian-Eurasian and Indo-Eurasian collision zones [9,10,4,5,12,14].

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H-index 64 – 172 peer-reviewed publications with a representative subset in the **Reference** list below.

References:

[1] T. Ho, K. Priestley, and E. Debayle. A global horizontal shear velocity model of the upper mantle from multimode Love wave measurements. *Geophysical Journal International*, 207(1):542–561, 2016.

[2] D. M^{c}Kenzie and K. Priestley. The influence of lithospheric thickness variations on continental evolution. *Lithos*, 102(1):1–11, 2008.

[3] D. M^{c}Kenzie and K. Priestley. Speculations on the formation of cratons and cratonic basins. *Earth and Planetary Science Letters*, 435:94–104, 2016.

[4] S. Mitra, K. Priestley, K. Borah, and V. Gaur. Crustal Structure and Evolution of the Eastern Himalayan Plate Boundary System, Northeast India. *Journal of Geophysical Research: Solid Earth*, 123(1):621–640, 2018.

[5] H. Paul, K. Priestley, D. Powali, S. Sharma, S. Mitra, and S. Wanchoo. Signatures of the existence of frontal and lateral ramp structures near the Kishtwar Window of the Jammu and Kashmir Himalaya: Evidence from microseismicity and source mechanisms. *Geochemistry, Geophysics, Geosystems*, 19(9):3097–3114, 2018.

[6] K. Priestley and D. M^{c}Kenzie. The thermal structure of the lithosphere from shear wave velocities. *Earth and Planetary Science Letters*, 244(1):285–301, 2006.

[7] K. Priestley and D. M^{c}Kenzie. The relationship between shear wave velocity, temperature, attenuation and viscosity in the shallow part of the mantle. *Earth and Planetary Science Letters*, 381: 78–91, 2013.

[8] K. Priestley, E. Debayle, D. M^{c}Kenzie, and S. Pilidou. Upper mantle structure of eastern Asia from multimode surface waveform tomography. *Journal of Geophysical Research: Solid Earth*, 111 (B10), 2006. doi:10.1029/2005JB004082.

[9] K. Priestley, J. Jackson, and D. M^{c}Kenzie. Lithospheric structure and deep earthquakes beneath India, the Himalaya and southern Tibet. *Geophysical Journal International*, 172(1):345–362, 2008.

[10] K. Priestley, D. M^{c}Kenzie, J. Barron, M. Tatar, and E. Debayle. The Zagros core: deformation of the continental lithospheric mantle. *Geochemistry, Geophysics, Geosystems*, 13(11), 2012.

[11] K. Priestley, D. M^{c}Kenzie, and T. Ho. A Lithosphere–Asthenosphere Boundary – A Global Model Derived from Multimode Surface-Wave Tomography and Petrology. In *Lithospheric Discontinuities, Geophysical Monograph 239, Edited by H. Yuan and B. Romanowicz*, pages 111–123. American Geophysical Union (AGU), 2018.

[12] K. Priestley, T. Ho, and S. Mitra. The crust structure of the Himalaya: a synthesis. *Geological Society, London, Special Publications*, 483:SP483–2018, 2019.

[13] K. Priestley, T. Ho, and D. McKenzie. The formation of continental roots. *Geology*, 49(2):190–194, 2021.

[14] K. Priestley, F. Sobouti, R. Mokhtarzadeh, M. A Irandoust, R. Ghods, K. Motaghi, and T. Ho. New Constraints for the On-Shore Makran Subduction Zone Crustal Structure. *Journal of Geophysical Research: Solid Earth*, 127(1):e2021JB022942, 2022.