

# Curriculum Vitae – Andrew Frederiksen

November 17, 2006

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## 1 Education

- 1997-2000 Ph.D., Geophysics (Seismology), University of British Columbia  
Title of thesis: *Seismic Imaging of the Canadian Upper Mantle*  
Supervisor: Dr. M.G. Bostock
- 1994-1996 M.Sc., Geophysics (Seismology), University of British Columbia  
Title of thesis: *A Teleseismic Study of the Northern Cordilleran Upper Mantle Beneath the SNORCLE Transect*  
Supervisor: Dr. M.G. Bostock
- 1991-1994 B.Sc. (Hons.), Solid Earth Geophysics, McGill University

## 2 Awards and Grants

- 09/2003-08/2007 National Science and Engineering Research Council of Canada (NSERC) Discovery Grant
- 09/2003 Canada Foundation for Innovation New Opportunities Grant
- 01/2001-06/2002 NSERC Post-Doctoral Fellowship
- 01/1997-12/1998 NSERC Post-Graduate Scholarship (PGS) B
- 09/1994-08/1996 NSERC PGS A
- 05/1994 Logan Medal, Department of Earth and Planetary Sciences (EPS), McGill University
- 09/1992-05/1994 R.P.D. Graham Scholarship, EPS, McGill University
- 09/1991-05/1992 Entrance Scholarship, EPS, McGill University

## 3 Courses taught (including upcoming courses)

- Fall 2002 through 2006: GEOL 2060 Introductory Geophysics, University of Manitoba

- Winter 2005, 2007: GEOL 3740 Exploration Seismology, University of Manitoba
- Winter 2005: GEOL 7230 Geophysics of the Earth's Crust and Mantle (co-taught), University of Manitoba
- Fall 2004: GEOL 7480 Advanced Seismology 1, University of Manitoba
- Summer 2004, 2007: GEOL 4260/4740 Geophysics Field Course (co-taught), University of Manitoba
- Winter 2004, 2006: GEOL 4810 Geophysical Data Analysis / 7260 Geophysical Information, University of Manitoba
- Winter 2002: EART113 Physics in the Earth Sciences, University of California Santa Cruz

## 4 Theses supervised

- Zhang, J. (M.Sc., Dec. 2005) 3-D Structure in Southern Ontario via Receiver Function Imaging.
- McPherson, J. (B.Sc., May 2005) Channel Boundary Delineation and Reservoir Prediction in Two Stacked Glauconitic Channel Reservoirs Using Forward Seismic Modelling, Spectral Decomposition and Event Similarity Prediction, Glauconitic Formation, Southeastern Alberta.
- Miong, S-K. (B.Sc., May 2005) Application of Shear-Wave Splitting Analysis in Imaging Asthenospheric and Lithospheric Anisotropy Beneath the Superior Province, Canadian Shield.
- Letkeman, A. (B.Sc., Dec. 2002) Imaging the Deep Structures of the Grenville Province, Ontario Using Teleseismic Receiver Functions.

## 5 Related Work Experience

- 07/2002-present    Assistant professor, University of Manitoba
- 01/2001-06/2002    Post-doctoral researcher, earthquake seismology  
Supervisor: Dr. J. Revenaugh, UCSC
- 01/1999-05/2000    Teaching Assistant, various earth science courses  
various supervisors, UBC
- 07/1994-12/2000    Research assistant, earthquake seismology  
Supervisors: Drs. M. Bostock & R. Ellis, UBC
- 05/1993-08/1993    Geophysics Summer Student, geophysical data processing  
Supervisor: Dr. D. Poley, Shell Canada

## 6 Refereed Publications

- Frederiksen, A.W., Miong, S.K., Darbyshire, F.A., Eaton, D.W., Rondenay, S., and Sol, S. (2006) Lithospheric variations across the Superior Province, Ontario, Canada: evidence from tomography and shear-wave splitting, submitted to *Journal of Geophysical Research*.
- Eaton, D.W. and Frederiksen, A.W. (2006) Seismic evidence for convection-driven motion of the North American plate, submitted to *Nature*.
- Darbyshire, F.A., Eaton, D.W., Frederiksen, A.W., and Ertolahti, L. (2006) New insights into the lithosphere beneath the Superior Province from Rayleigh wave dispersion and receiver function analysis, *Geophysical Journal International*, in press.

- Frederiksen, A.W., Ferguson, I.J, Eaton, D., Miong, S.-K., and Gowan, E. (2006) Mantle Fabric at Multiple Scales Across an Archean-Proterozoic Boundary, Eastern Ontario, Canada, *Physics of the Earth and Planetary Interiors*, in press.
- Van der Lee, S. and Frederiksen, A.W. (2005) Surface-wave tomography applied to the North American upper mantle, in *Seismic Earth: Array Analysis of Broadband Seismograms*, American Geophysical Union Geophysical Monograph 157, 67-80.
- Eaton D., Frederiksen, A. and Miong, S.K. (2004) Shear-wave splitting observations in the lower Great Lakes region: Evidence for regional anisotropic domains and keel-modified asthenospheric flow, *Geophysical Research Letters* **31**, Art. No. L07610.
- Frederiksen, A.W. and Revenaugh, J. (2004) Lithospheric imaging via teleseismic scattering tomography, *Geophysical Journal International* **159**, 978-990.
- Sherrington, H., Zandt, G., and Frederiksen, A.W. (2004) Crustal Fabric in the Tibetan Plateau Based on Waveform Inversions for Seismic Anisotropy Parameters, *Journal of Geophysical Research* **109** b02312, doi:10.1029/2002jb002345.
- Frederiksen, A.W., Folsom, H., and Zandt G. (2003) Neighbourhood inversion of teleseismic Ps conversions for anisotropy and layer dip, *Geophysical Journal International* **155**, 200-212
- Frederiksen, A.W., Bostock, M.G., and Cassidy, J.F. (2001) *S*-wave velocity structure of the Canadian upper mantle. *Physics of the Earth and Planetary Interiors* **124**: 175-191.
- Frederiksen, A.W., and Bostock, M.G. (2000) Modelling teleseismic waves in dipping anisotropic structures. *Geophysical Journal International* **141**: 401-412.
- Frederiksen, A.W., Bostock, M.G., VanDecar, J.C., and Cassidy, J.F. (1998) Seismic structure of the upper mantle beneath the northern Canadian Cordillera from teleseismic travel-time inversion. *Tectonophysics* **294**: 43-55.
- Shi, L., Francis, D., Ludden, J., Frederiksen, A., and Bostock, M. (1998) Xenolith evidence for lithospheric melting above anomalously hot mantle under the northern Canadian Cordillera. *Contributions to Mineralogy and Petrology* **131**: 39-53.

## 7 Selected Recent Conference Presentations

- Frederiksen, A.W., Darbyshire, F., Eaton, D. and Ferguson, I. (2006). Lithospheric Anisotropy and Structure Beneath the Superior and Grenville Provinces, Eastern Canada: Top-Down and Bottom-Up Influences on the Cratonic Root, oral presentation, Workshop on Seismic Anisotropy and Geodynamics of the Lithosphere-Asthenosphere System, Trest, Czech Republic.
- Frederiksen, A.W., Miong, S., Darbyshire, F., Rondenay, S., and Sol, S. (2005). Variations in Lithospheric Thickness Across the Superior Province, Ontario, Canada: Evidence from Tomography and Shear-Wave Splitting, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract T13A-0430.
- Zhang, J., and Frederiksen, A.W. (2005). Three-Dimensional Structure in Southern Ontario via Receiver Function Imaging, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., Abstract T13A-0431.
- Frederiksen, A.W., Zhang, J., and Revenaugh, J. (2005) Inversion of the Teleseismic P Coda for Lithospheric Structure: Examples From Ontario and California, *Eos Trans. AGU*, 86(18), Jt. Assem. Suppl., Abstract S44A-05.
- Miong, S.-K. and Frederiksen, A.W. (2005) Mantle Fabric and Lithospheric Thickness Beneath the Superior Province, oral presentation, 2005 Annual Scientific Meeting of the Canadian Geophysical Union.

- Frederiksen, A.W., Miong, S.-K., and Eaton, D. (2004) Mantle Fabric Beneath Ontario: Results From the CNSN, FEDNOR and POLARIS Arrays, Poster, 2004 AGU Fall Meeting, Abstract T33A-1326, San Francisco, December 2004.
- Van der Lee, S. and Frederiksen, A.W. (2004), IRIS and the S-velocity structure of the North American upper mantle, Presentation, 2004 AGU Fall Meeting, Abstract S52B-06, San Francisco, December 2004.
- Eaton, D.W., Frederiksen, A., and Miong, S. (2004) Shear-wave splitting observations in the lower Great Lakes region, Poster, 2004 Joint Assembly (AGU/CGU/SEG), Abstract S23B-04, Montreal, May 2004.
- Frederiksen, A.W., Miong, S.-K., and Eaton, D. (2004) Possible Subcrustal Anisotropic Fabric Beneath the Grenville Orogen, Poster, 2004 Joint Assembly (AGU/CGU/SEG), Abstract S33A-03, Montreal, May 2004.
- Van der Lee, S. and Frederiksen, A.W. (2004), A Merged Surface-Wave Based Image of the North American Upper Mantle. Poster, 2004 Joint Assembly (AGU/CGU/SEG), Abstract T21B-02, Montreal, May 2004.