

Zachary Cohen Eilon

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2016 Webb Hall
UC Santa Barbara
Santa Barbara, CA 93106

RESEARCH APPOINTMENTS

Assistant Professor	2016 – present
<i>Dept. of Earth Science; University of California, Santa Barbara, USA</i>	
Postdoctoral Research Associate	2016 – 2017
<i>Dept. of Earth, Environmental and Planetary Sciences; Brown University, USA</i>	
Graduate Research Fellow	2011 – 2016
<i>Columbia University in the City of New York, USA</i>	

EDUCATION

PhD, Seismology , Columbia University in the City of New York, USA,	2016
<i>New Constraints on Extensional Environments through Analysis of Teleseisms.</i> <i>Advisor: Geoffrey A. Abers</i>	
MPhil , Columbia University in the City of New York, USA,	2014
Special Studentship , Harvard University, USA,	2010 - 2011
MSci, Natural Sciences (Physical) , University of Cambridge, UK,	2009 - 2010
<i>Senior thesis: Investigation of crustal earthquakes near Upptyppingar, Iceland.</i>	
MA (Cantab), Natural Sciences (Physical) , University of Cambridge, UK,	2006 - 2009
<i>Geologic mapping project: Geology of Southern Vounassa, Greece.</i>	

PEER-REVIEWED PUBLICATIONS

- Eilon, Z., K. M. Fischer, and C. A. Dalton, (2018) “[An adaptive Bayesian inversion for upper mantle structure using surface waves and scattered body waves](#)”, *Geophysical Journal International*, 214, 232-253, doi:10.1093/gji/ggy137.
- Lynner, C., S. L. Beck, G. Zandt, R. W. Porritt, F-C. Lin, Z. Eilon, (2018) “[Mid-crustal deformation in the Central Andes constrained by radial anisotropy](#)”, *Journal of Geophysical Research - Solid Earth*, 123, 4798-4813, doi:10.1029/2017JB014936.
- Eilon, Z. and G. A. Abers, (2017) “[High seismic attenuation at a mid-ocean ridge reveals the distribution of deep melt](#)”, *Science Advances*, 3, e1602829, doi:10.1126/sciadv.1602829.
- Dannberg, J., Z. Eilon, U. Faul, R. Gaßmüller, P. Moulik, R. Myhill*, (2017) “[Investigating the geodynamic and seismological importance of grain size in the Earth](#)”, *Geochemistry Geophysics Geosystems*, doi:10.1002/2017GC006944.
*Collaborative research from 2014 CIDER workshop; equal authorship credit.
- Eilon, Z., G. A. Abers, and J. B. Gaherty, (2016) “[A Joint Inversion for \$V_S\$ and Anisotropy: The Woodlark Rift, Papua New Guinea](#)”, *Geophysical Journal International*, doi:10.1093/gji/ggw177.
- Abers, G. A., Z. Eilon, J. B. Gaherty, G. Jin, YH. Kim, M. Obrebski, and C. Dieck, (2016) “[Southeast Papuan crustal tectonics: imaging extension and buoyancy of an active rift](#)”, *Journal of Geophysical Research*, 125, 951-971, doi:10.1002/2015JB012621.

4. [Eilon, Z.](#), G. A. Abers, J. B. Gaherty, and G. Jin, (2015) “[Imaging Continental Breakup using Teleseismic Body Waves: The Woodlark Rift, Papua New Guinea](#)”, *Geochemistry Geophysics Geosystems*, 16, doi:10.1002/2015GC005835.
3. Jin, G., J. B. Gaherty, G. A. Abers, YH Kim, [Z. Eilon](#), and W. R. Buck, (2015) “[Crust and upper mantle structure associated with extension in the Woodlark Rift, Papua New Guinea from Rayleigh-wave tomography](#)”, *Geochemistry Geophysics Geosystems*, doi:10.1002/2015GC005840.
2. Menke, W. and [Z. Eilon](#), (2015) “[Relationship between data smoothing and the regularization of inverse problems](#)”, *Pure and Applied Geophysics*, doi:10.1007/s00024-015-1059-0.
1. [Eilon, Z.](#), G. A. Abers, G. Jin, and J. B. Gaherty, (2014) “[Anisotropy beneath a highly extended continental rift](#)”, *Geochemistry Geophysics Geosystems*, 15, doi:10.1002/2013GC005092.

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PENDING MANUSCRIPTS

- Janiszewski, H. J., J. B. Gaherty, G. A. Abers, H. Gao, and [Z. Eilon](#), (submitted) “Amphibious surface-wave phase-velocity measurements of the Cascadia subduction zone”, *Geophys. J. Int.*.
- Bezada, M., J. Byrnes, and [Z. Eilon](#), (submitted) “Implications of measurement parameters on estimates of seismic attenuation: a case study using the North Korean nuclear test”, *Geophys. J. Int.*.
- Russell, J., [Z. Eilon](#), and S. Mosher, (submitted) “A new tool for the precise remote location of ocean bottom seismometers”, *Seismological Research Letters*.
- [Eilon, Z.](#), K. M. Fischer, and C. A. Dalton, (in prep.) “The deep structure of North American lithosphere imaged by adaptive Bayesian inversion”.

CONFERENCE PROCEEDINGS

32. [Eilon, Z.](#), J. Petruska, and K. Keranen (Upcoming - 2019), New constraints on the East African rift from axis to flank using a combination of seismic data types waves, *GeoPRISMS Synthesis TEI*, 2019
31. Gama, I., K. M. Fischer, [Eilon, Z.](#), C. A. Dalton, and L. Flesch (Upcoming - 2019), The structure of the upper plate lithosphere and asthenosphere in Alaska from inversion of scattered body wave phases and Rayleigh wave phase velocities, *EGU General Assembly 2019*, EGU2019-10149
30. [Eilon, Z.](#), K. M. Fischer, and C. A. Dalton (2018), The deep structure of North American lithosphere illuminated by complementary seismic data types, *AGU Fall Meeting 2018*, Abstract #DI51B-0595
29. Krueger, H. E., K. M. Fischer, [Eilon, Z.](#) (2018), Understanding the origins of the mid-lithospheric discontinuities in the Kalahari craton, *AGU Fall Meeting 2018*,
28. Gama, I., K. M. Fischer, [Eilon, Z.](#), C. A. Dalton, and L. Flesch (2018), The structure of the upper plate lithosphere and asthenosphere in Alaska from inversion of scattered body wave phases and Rayleigh wave phase velocities, *AGU Fall Meeting 2018*,
27. [Eilon, Z.](#), K. M. Fischer, and C. A. Dalton (2018), An adaptive Bayesian inversion for upper mantle structure using surface waves and scattered body waves, *IRIS Workshop 2018*, Session: Advancing Earth System Science with Geophysical Observations
26. [Eilon, Z.](#), K. M. Fischer, and C. A. Dalton (2017), North American Crust and Upper Mantle Structure Imaged Using an Adaptive Bayesian Inversion, *AGU Fall Meeting 2017*, Abstract #DI23A-0404

25. Gaßmüller, R., J. Dannberg, Z. Eilon, U. Faul, P. Moulik, and R. Myhill - Joint submission (2017), The Importance of Grain Size to Mantle Dynamics and Seismological Observations, *AGU Fall Meeting 2017*, Abstract #DI44A-06
24. Castaneda, R. S., G. A. Abers, Z. Eilon, and D. Christensen (2017), Teleseismic P and S wave attenuation constraints on temperature and melt of the upper mantle in the Alaska subduction zone, *AGU Fall Meeting 2017*, Abstract #S33C-0880
23. Eilon, Z., K. M. Fischer, and C. A. Dalton (2017), A Bayesian inversion for upper mantle structure, *OBSIP 2017 OBS Symposium*,
22. Eilon, Z., G. A. Abers, J. B. Gaherty, G. Jin, and W. R. Buck (2017), The Woodlark Rift, a case study in young continental breakup, *GeoPRISMS RIE TEI* , 2017
21. Eilon, Z. and G. A. Abers (2016), High seismic attenuation at a mid-ocean ridge reveals the distribution of deep melt, *AGU Fall Meeting 2016*, Abstract #DI11A-2324
20. Hariharan, A., K. M. Keranen, S. Alemayehu, A. Ayele, I. D. Bastow and Z. Eilon (2016), Velocity Models of the Upper Mantle Beneath the MER, Somali Platform, and Ethiopian Highlands from Body Wave Tomography, *AGU Fall Meeting 2016*, Abstract #T51C-2923
19. Eilon, Z. and G. A. Abers (2016), Seismic attenuation of body waves measured from ridge to trench, *SZO Workshop 2016*, Session: General.
18. Eilon, Z. and G. A. Abers (2016), Seismic attenuation of body waves measured across an entire oceanic plate, *IRIS Workshop 2016*, Session: Unlocking the Secrets of Subduction Zones
17. Janiszewski, H. J., J. B. Gaherty, Z. Eilon, and N. J. Accardo (2016), Surface wave imaging of the Juan de Fuca plate and Cascadia subduction zone using an amphibious dataset, *IRIS Workshop 2016*, Session: Unlocking the Secrets of Subduction Zones
16. Gaßmüller, R., J. Dannberg, Z. Eilon, P. Moulik, R. Myhill, and U. Faul (2016), The Importance of Grain Size to Mantle Dynamics and Seismological Observations: A Multidisciplinary Approach, *EGU General Assembly 2016*, Abstract EGU2016-11078 - Joint submission based on collaborative work begun at CIDER workshop 2014
15. Eilon, Z. and G. A. Abers (2015), Seismic Attenuation of Teleseismic Body Waves in Cascadia, Measured on the Amphibious Array, *AGU Fall Meeting 2015*, Abstract #T51D-2903
14. Eilon, Z. and G. A. Abers (2015), Seismic Attenuation Across the Juan de Fuca Plate from Ridge to Trench to Arc, *OBSIP 2015 OBS Symposium*,
13. Eilon, Z., G. A. Abers, and J. B. Gaherty (2015), A joint inversion for shear velocity and anisotropy in the Woodlark Rift, Papua New Guinea, *Gordon Research Conference 2015: Interior of the Earth*,
12. Eilon, Z., J. Dannberg, R. Gaßmüller, P. Moulik, R. Myhill, and U. Faul (2015), The importance of grain size to mantle dynamics and seismological observations: a multidisciplinary approach, *Gordon Research Seminar 2015: Interior of the Earth*, Joint submission based on collaborative work begun at CIDER workshop 2014
 - This talk was selected as one of two student talks given at the Gordon Research Conference the following week
11. Dannberg J., Z. Eilon, R. Gaßmüller, P. Moulik, R. Myhill, U. Faul, and P. Asimow (2015), Grain size evolution in the mantle and its effect on geodynamics, seismic velocities and attenuation, *EGU General Assembly 2015*, Abstract EGU2015-10825 - Joint submission based on collaborative work begun at CIDER workshop 2014
10. Eilon, Z., G. A. Abers, J. B. Gaherty, and G. Jin (2014), A Joint Inversion for Velocity and Anisotropy Structure Beneath a Highly Extended Continental Rift, *AGU Fall Meeting 2014*, Abstract #T54A-06

9. Abers, G. A., Obrebski, M. J., G. Jin, and Z. Eilon (2014), Rift Structure in Eastern Papua New Guinea From the Joint Inversion of Receiver Functions and Seismic Noise, *AGU Fall Meeting 2014*, Abstract #T54A-07
8. Myhill, R., J. Dannberg, Z. Eilon, R. Gaßmüller, P. Moulik, U. Faul, and P. Asimow (2014), Grain size evolution in the mantle and its effect on geodynamics and seismic observables, *AGU Fall Meeting 2014*, Abstract #DI23A-4280 - Joint submission based on collaborative work begun at CIDER workshop 2014
7. Eilon, Z., G. A. Abers, YH Kim, and J. B. Gaherty (2013), Teleseismic body wave tomography within a highly extended continental rift: the Woodlark Rift, Papua New Guinea, *AGU Fall Meeting 2013*, Abstract #T12B-07
6. Dieck, C. C., G. A. Abers, Z. Eilon, J. B. Gaherty, and R. Verave (2013), Seismicity in an active rift exposing ultra-high pressure metamorphic rocks: D'Entrecasteaux Islands, Papua New Guinea, *AGU Fall Meeting 2013*, Abstract #T21A-2524
5. Jin, G., J. B. Gaherty, G. A. Abers, YH Kim, Z. Eilon, W. R. Buck, and R. Verave (2013), Surface wave tomography of D'Entrecasteaux Islands, Papua New Guinea, implication of mantle control on localization of extension and exhumation, *AGU Fall Meeting 2013*, Abstract #T21B-2554
4. Eilon, Z., G. A. Abers, YH Kim, J. B. Gaherty, G. Jin, and R. Verave (2012), Seismic anisotropy and mantle structure beneath the D'Entrecasteaux Islands, Papua New Guinea, *AGU Fall Meeting 2012*, Abstract #T42C-07
3. Abers, G. A., YH Kim, J. B. Gaherty, Z. Eilon, G. Jin, and R. Verave (2012), Imaging to understand exhumation of UHP rocks during rifting: the 2010-2011 CDPapua seismic experiment, *AGU Fall Meeting 2012*, Abstract #T42C-06
2. Jin, G., J. B. Gaherty, G. A. Abers, YH Kim, Z. Eilon, W. R. Buck, and R. Verave, (2012), Imaging crust and mantle structure beneath the D'Entrecasteaux Islands, Papua New Guinea, from Rayleigh wave tomography, *AGU Fall Meeting 2012*, Abstract #T43E-2719
1. Eilon, Z., YH Kim, G. A. Abers, J. B. Gaherty, G. Jin, R. Verave, and L. M. Wallace (2012), Anisotropy beneath the propagating Woodlark rift, Papua New Guinea: a comparison of four shear wave splitting techniques, *IRIS Workshop research highlight*, Session: Mantle and Core Structure and Dynamics

FUNDING

- National Science Foundation - EAR #1753722 (submitted - awarded), “Collaborative Research: Lithosphere-scale anisotropic imaging across the Eastern North American Margin’s ocean-continent transition”, \$183,537 (Co-PI Colton Lynner [U. Arizona], 1/18 - 12/19).
- National Science Foundation - EAR #1723170, “Collaborative Research: The context for rifting in East Africa - melt distribution and lithospheric removal imaged from axis to flank”, \$276,528 (Co-PI Katie Keranen [Cornell U.], 5/18 - 4/21).
- National Science Foundation - OCE #1658214, “Collaborative Research: Imaging small-scale convection and structure of the mantle in the south Pacific: a US contribution to an international PacificArray”, \$357,265 (Co-PIs Jim Gaherty & Göran Ekström [LDEO], Don Forsyth [Brown U.], 8/17 - 7/21).
- National Science Foundation - OCE #1536566, “Thermal and melt structure of the Juan de Fuca plate from ridge to trench to arc, inferred from seismic attenuation across the Amphibious Array”, \$80,480 (co-wrote proposal with PI Geoff Abers, 8/15 - 8/16).
- CIDER research grant - funded through NSF via UC Berkeley, “Investigating mantle dynamics using a composite rheology with grain size evolution, tested using seismology”, \$3,700 (co-wrote proposal with CIDER research group, 10/14 - 10/15).

- Dept. of Earth and Environmental Sciences - Columbia University, “Chevron Student Initiative Fund”, \$2,543 (for partial funding of Seismology Student Workshop 2016, 12/15).
- LDEO, “Seismology Student Workshop sponsorship (SSW) 2015”, \$7,600 (wrote proposal with SSW committee, 3/15).
- Storke Fund - Columbia University, “Dept. of Earth and Environmental Sciences graduate student fieldtrip 2014”, \$8,800 (co-wrote proposal with organising committee, 4/14).
- ConocoPhillips, “Seismology Student Workshop sponsorship 2014”, \$5850 (co-wrote proposal with Ge Jin., 3/14).

SERVICE

- [IRIS PASSCAL standing committee, 2018-2021](#)
- UCSB Earth Science hiring committee, LPSOE appointment, 2018
- Convener: GeoPRISMS Mini-Workshop 2017 “[ENAM science advances: Progress and outlook](#)”
- Chair: [2017 Gordon Research Seminar – Interior of the Earth](#)
- Referee: *Geochemistry, Geophysics, Geosystems; Journal of Geophysical Research; Physics of the Earth and Planetary Interiors; NSF Geophysics Program; NSF Earthscope Program*
- AGU Fall Conference session convener (2016, 2017); AGU OSPA liason (2016, 2017); AGU OSPA judge (2016, 2017); GeoPRISMS judge (2016, 2017)
- Organising Committee: [LDEO Seismology Student Workshop](#); 2016 (committee member) 2015 (committee member), 2014 (committee chair), 2013 (founding committee member).

PRIZES/AWARDS

- 2015 GeoPRISMS AGU Prize for Outstanding Student Presentation (awarded for poster presentation *Seismic Attenuation of Teleseismic Body Waves in Cascadia, Measured on the Amphibious Array* - Abstract #T51D-2903)
- 2014 Outstanding Student Paper Award at 2014 AGU Fall Meeting (awarded for oral presentation *A Joint Inversion for Velocity and Anisotropy Structure Beneath a Highly Extended Continental Rift* - Abstract #T54A-06)
- 2013 Outstanding Student Paper Award at 2013 AGU Fall Meeting (awarded for oral presentation *Teleseismic body wave tomography within a highly extended continental rift: the Woodlark Rift, Papua New Guinea* - Abstract #T12B-07)
- 2011 Herchel Smith scholarship to attend Harvard University (awarded by Emmanuel College)
- 2008, 2009 Davies Senior Scholarship at Emmanuel College, Cambridge (re-elected)
- 2007 Junior Scholarship at Emmanuel College, Cambridge

SKILLS

Programming: MATLAB, L^AT_EX, Python, GMT, fortran, shell scripting.

Languages: English (native), French (basic), Hebrew (basic).

Software: Microsoft Office, Git, Vim, Inkscape, ParaView, SAC, REF TEK RTI software suite.

Areas of focus: Seismology, Anelasticity and Seismic Attenuation, Seismic Data Processing,

Geophysical Inverse Theory, Seismic Anisotropy, Tectonophysics, Seismic Tomography, Geodynamics, Geology

INVITED SEMINARS AND TALKS

13. California Institute of Technology, Department Seminar, 11/09/18
12. University of Nevada, Reno, Geoscience Seminar - IRIS Early Career Speaker, 09/17/18
11. University of Texas Institute of Geophysics, Department Seminar, 02/16/18
10. Princeton University, Brown bag talk, 03/31/17
9. GeoPRISMS TEI Workshop, Rifting Dynamics session, 02/08/17
8. Brown University, Solid Earth Dynamics Seminar, 11/01/16
7. LDEO Columbia University, Public Thesis Defence, 06/21/16
6. University of California, Santa Barbara, Department seminar, 02/01/16
5. Brown University, Department Seminar, 01/27/16
4. DTM Carnegie Institution for Science, DTM Weekly seminar series, 01/19/16
3. LDEO Columbia University, Seismology, Geophysics & Tectonics seminar, 10/28/15
2. Cornell University, Andes Seminar, 9/19/14
1. LDEO Columbia University, Seismology, Geophysics & Tectonics seminar, 4/23/14

STUDENTS

Principal advisor:

- Jon Petruska (UCSB, PhD - expected graduation 2024)

Thesis committee member:

- Aaron Anderson (UCSB, PhD - expected graduation 2021)
- Ryan Stoner (UCSB, PhD - expected graduation 2021)
- Justin Newman (UCSB, PhD - expected graduation 2021)
- Sean Maher (UCSB, PhD - expected graduation 2022)
- Francisco Apen (UCSB, PhD - expected graduation 2022)

FIELDWORK AND WORKSHOPS

- Nov-Dec 2018 Seismicity and structure of the Santa Ynez mountains - deployment
- Deployment of UCSB broadband seismometers in mini-arrays within the Sedgwick Reserve (Santa Barbara County, CA)
 - Project involved UCSB undergraduates and grad student
- July 2018 [CIDER Summer Program](#) - workshop
- interdisciplinary workshop with focus on the “Relating Geophysical and Geochemical Heterogeneity in the Deep Earth”
 - senior participant
- Apr-May 2018 [US PacificArray #1](#) - OBS deployment
- Co-chief scientist aboard R/V Kilo Moana, deploying 30 broadband OBS instruments and conducting multibeam surveys in the central Pacific
 - collaboration with PIs J. Gaherty (LDEO), D. Forsyth (Brown U.), & G. Ekström (Columbia U.)
- Feb 2015 [Exploring Extensional Tectonics Beyond the Ethiopian Rift](#) - service run
- led team servicing & redeploying 31 broadband seismometers in Ethiopia
 - trained Ethiopian colleagues
 - collaboration with PI Katie Keranen (Cornell U.) & researchers in Addis Ababa
- Jan 2015 [ENAM Community Seismic Experiment](#) - service run
- checked SOH & recovered data from 3 on-land broadband stations
- July 2014 [CIDER Summer Program](#) - workshop
- interdisciplinary workshop with focus on the “Dynamics of Planetary Interiors”
 - joined research group investigating geodynamic and seismological role of grain size in the Earth
- June 2014 [iMUSH Experiment](#) - deployment
- deployment of 70 broadband seismometers around Mt. St. Helens
 - trained in huddle testing, REFTEK software, station construction
 - led field teams for daily deployments
- June 2012 [Juan de Fuca: Ridge to Trench experiment](#) - deployment
- deployed 13 broadband seismometers in WA as on-land extension of active source experiment
 - trained in huddle testing, direct burial
- Jul-Aug 2009 Tracking Melt Injection Near Askja, Central Iceland - service + deployment
- serviced old network and emplaced new seismic network
 - responsible for instrument orientation (using differential GPS), solar panel construction, and battery installation
 - part of Masters project under supervision of Prof. Robert White
- Jul-Aug 2008 [Aliakmon River Project for IGME, Greece](#) - geologic mapping
- mapped 10 km² area in Northern Hellenides, Greece