

Zachary Cohen Eilon

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RESEARCH APPOINTMENTS

- Assistant Professor (on leave until July 2017)** 2016 – present
Dept. of Earth Science; University of California, Santa Barbara, USA
- Postdoctoral Research Associate** 2016 – present
Dept. of Earth, Environmental and Planetary Sciences; Brown University, USA
- Graduate Research Fellow** 2011 – 2016
Columbia University in the City of New York, USA

EDUCATION

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

PEER-REVIEWED PUBLICATIONS

7. Eilon, Z. and G. A. Abers, (2017) “High seismic attenuation at a mid-ocean ridge reveals the distribution of deep melt”, *Science Advances*, accepted.
6. 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.
5. 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, J. B. Gaherty, (2014) “Anisotropy beneath a highly extended continental rift”, *Geochemistry Geophysics Geosystems*, 15, doi:10.1002/2013GC005092.

PENDING MANUSCRIPTS

- Dannberg, J., Z. Eilon, U. Faul, R. Gaßmüller, P. Moulik, R. Myhill, (90% complete) “Investigating the geodynamic and seismological importance of grain size in the Earth”, *Collaborative project begun at 2014 CIDER workshop*.
- Eilon, Z. and K. Fischer, (20% complete) “Constraints on mid-lithospheric cratonic structure from a Bayesian inversion of multiple seismic datatypes”.

CONFERENCE PROCEEDINGS

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 Workshop*, 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*, Mantle and Core Structure and Dynamics section

FUNDING

- National Science Foundation - EAR-PF (SUBMITTED - PENDING), “EAR-PF Mantle structure and lithospheric removal in East Africa, imaged by joint inversion of receiver functions and surface waves”, \$174,000 (To work in collaboration with researchers at Brown U. and Cornell U., nominal dates 9/16 - 9/18).
- 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

- Chair-elect: Gordon Research Seminar – Interior of the Earth (to be held in 2017)
- Referee: *Geochemistry, Geophysics, Geosystems; Physics of the Earth and Planetary Interiors; NSF Geophysics Program*
- AGU Fall Conference session convener, AGU OSPA liason, AGU OSPA judge, GeoPRISMS judge
- Organising Committee: [LDEO Seismology Student Workshop](#)

2016 (committee member) 2015 (committee member), 2014 (committee chair), 2013 (founding committee member).

Two-day workshop organised and attended by graduate students to present/discuss research and methodology in a collaborative setting. The 2015 workshop drew 41 attendees from 15 universities across the US and I was interviewed on the *Don't Panic Geocast* podcast about the workshop and its growing reputation/success.

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, shell scripting, html.

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

SEMINARS AND TALKS

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

TEACHING

At Columbia University, Dept. of Earth and Environmental Sciences

Spring 2016: **V4300 Seminar on Continental Rifting - Co-organiser**

Fall 2015: **V4300 Earth's Deep Interior - Guest Lecturer**

- Lectured on convection within the Earth and its geodynamic implications
- Prof. G. Ekström

Fall 2014: **V2200 Solid Earth System - Teaching Assistant**

- Updated and refined lab syllabus and assignments written the previous year. Led lab sessions, graded lab assignments, and provided 1-to-1 mentorship at weekly office hours
- Feedback: rated 4.73/5, comments: "His explanations clarify while still allowing the student to figure some things out for him/herself."; "Zach is the best TA I have ever had. I've never had a TA before who was also clearly a great teacher."; "went out of his way to get us excited about the earth"; "Zach is great, he should really just be teaching the entire course."
- Profs. M. Tolstoy & A. Malinverno

Fall 2013: **V2200 Solid Earth System - Teaching Assistant**

- Re-wrote lab syllabus and assignments for this course to improve their quality and breadth. Led lab sessions, graded lab assignments, participated in class field trip, and provided 1-to-1 mentorship at weekly office hours.
- Feedback: rated 4.9/5, comments: "Great, always attentive and excited about subject matter. Always willing to help students."; "Should be a professor. Explains things and understands the subject matter much more effectively than most Columbia professors I've had"; "Knowledgeable and passionate about material."
- Profs. M. Tolstoy & A. Malinverno

Fall 2012: **V2200 Solid Earth System - Teaching Assistant**

- Led lab sessions, graded lab assignments, participated in class field trip, and provided 1-to-1 mentorship at weekly office hours. Introduced weekly not-for-credit quizzes to help students track and test their understanding and progress.
- Feedback: rated 4.1/5, comments: "Really helps in clarifying course material and engages students by forming a connection with them. One of the best TAs I have ever had"; "He's great at explaining concepts, and also great at keeping lab entertaining. He should be a lecturer: humorous, informative, and up-beat"; "Literally the best. . . fun, engaging, and knew the content really well."
- Profs. M. Tolstoy & A. Malinverno

FIELDWORK AND WORKSHOPS

- Feb 2015 [Exploring Extensional Tectonics Beyond the Ethiopian Rift](#) - service run (22d)
- 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 (4d)
- checked SOH & recovered data from 3 on-land broadband stations
- July 2014 [CIDER Summer Program](#) - workshop (4 weeks)
- 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 (14d)
- deployment of 70 broadband seismometers around Mt. St. Helens
 - trained in huddle testing, REFTEK software, solar panel construction, vault construction
 - led small field team for daily deployments
- June 2012 [Juan de Fuca: Ridge to Trench experiment](#) - deployment (18d)
- 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 (16d)
- 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 (7 weeks)
- mapped 10 km² area in Northern Hellenides, Greece
 - produced field report on the geology of Mt. Vounassa, inc. map + cross sections
 - work in collaboration with our local contact/supervisor Dr. Annie Rassios
- 2007-2008 Cambridge University Earth Science Department trips - total 45 days in the field
- Gulf of Corinth and Gulf of Evia (Greece), Isle of Skye (UK), Cornwall and Devon (UK), Isle of Arran (UK)
 - basic geologic mapping, structural geology, etc.