

## MARK DIETRICH BEHN

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<http://www.whoi.edu/science/GG/people/mbehn/>

### Research Interests

My research seeks to understand the dynamics of Earth deformation in glacial, marine, and terrestrial environments. In particular, I develop geodynamic models and test them using quantitative constraints from geological, geophysical, and geodetic observations.

### Education

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|------|---|
| 2002 | Ph.D., MIT/WHOI Joint Program in Oceanography and Applied Ocean Science and Engineering |
| 1996 | B.S., Bates College, <i>summa cum laude</i> (Majors: Physics, Geology & Mathematics)    |

### Appointments

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|-----------|--|
| 2018–     | Associate Professor, Department of Earth and Environmental Sciences, Boston College                        |
| 2016–2018 | Senior Scientist, Department of Geology and Geophysics, Woods Hole Oceanographic Institution               |
| 2011–2016 | Associate Scientist w/ Tenure, Department of Geology and Geophysics, Woods Hole Oceanographic Institution  |
| 2008–2011 | Associate Scientist w/o Tenure, Department of Geology and Geophysics, Woods Hole Oceanographic Institution |
| 2004–2008 | Assistant Scientist, Department of Geology and Geophysics, Woods Hole Oceanographic Institution            |
| 2005–2012 | Visiting Investigator, Department of Terrestrial Magnetism, Carnegie Institution of Washington             |
| 2002–2004 | Carnegie Postdoctoral Fellow, Department of Terrestrial Magnetism, Carnegie Institution of Washington      |
| 2002      | Postdoctoral Associate, MIT  |
| 1996–2002 | Research and Teaching Assistant, MIT/WHOI  |
| 1994–1996 | Teaching Assistant, Bates College  |

### Honors & Awards

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|-----------|--|
| 2010–2013 | Fellow, WHOI Deep Ocean Exploration Institute  |
| 2002–2004 | Postdoctoral Fellow, Department of Terrestrial Magnetism, Carnegie Institution of Washington |
| 2000      | AGU Outstanding Student Paper Award  |
| 1997–2000 | Department of Defense Graduate Fellowship  |
| 1995      | Phi Beta Kappa, Gamma of Maine Chapter   |
| 1996      | Sigma Xi, Southern Maine Chapter   |

- 1996 Louis Jordan Jr. Award (awarded for the most outstanding senior thesis of a graduating geology major)
- 1996 Milton L. Lindholm Scholar-Athlete Award (awarded to best graduating male student-athlete)
- 1996 Bates College Key (organization of men and women who have served Bates College in an exemplary manner as students or alumni)
- 1994,1995 Howard Hughes Medical Institute Research Grants
- 1993 Charles A. Dana Award Scholar, Bates College
- 1992 Eagle Scout, Boy Scouts of America

### Professional Societies

- 2009– Geochemical Society
- 2000– American Association for the Advancement of Science
- 1997– American Geophysical Union
- 1995– Geological Society of America

### Service to Community

- 2020– SZ4D Landscapes and Seascapes Working Group
- 2019– Long Term Tectonics Working Group, Computational Infrastructure for Geodynamics (CIG)
- 2018– Modeling Collaboratory for Subduction, Steering Committee
- 2017– Committee on Seismology and Geodynamics, National Academy of Sciences
- 2011– Associate Editor, Journal of Geophysical Research (Solid Earth)
- 2013–2019 Co-Chair, Geodynamics Focus Research Group, Community Surface Dynamics Modeling System (CSDMS)
- 2018 Co-organizer, NSF-sponsored Coupling of Tectonic and Surface Processes (CTSP) Workshop, Boulder CO, April 25–27.
- 2011–2016 Magma Dynamics Working Group, Computational Infrastructure for Geodynamics
- 2011–2014 AGU Tectonophysics Section Nominating Committee
- 2013 Co-Convener, GeoPRISMS Mini-Workshop, *Exploring the interplay between solid Earth tectonics and surface processes using community codes*, San Francisco, CA, December 13, 2013.
- 2013 NSF-OPP Arctic Natural Sciences Panel Member
- 2008–2010 MARGINS/GeoPRISMS Steering Committee
- 2010 Co-writer, MARGINS Successor Draft Science Plan
- 2010 Co-convener, MARGINS Successor Planning Workshop, San Antonio, TX
- 2009 Co-convener, MARGINS RCL Planning Workshop, Charleston, SC
- 2008–2009 AGU Fall Meeting Planning Committee, Tectonophysics Representative
- 2007 Geodynamics Group Leader, NSF Marine Heatflow Workshop, Salt Lake City, UT.
- 2004–2009 Falmouth Academy Science Fair Judge
- 2000 Massachusetts Science Fair Judge

Manuscript Reviewer: *Science, Nature, Nature Geoscience, Science Advances, Proc. Nat. Acad. Sci., Journal of Geophysical Research, Earth and Planetary Science Letters, Geophysical Research Letters, Geophysical Journal International, Geology, Geofluids, Marine Geophysical Researches, Chemical Geology, Physics of Earth and Planetary Interiors, Tectonics, Tectonophysics, Annals of Glaciology, and AGU Geophysical Monograph Series*

Proposal Reviewer: *National Science Foundation, IODP, NASA, NERC, Petroleum Research Fund, Swiss NSF, and InterRidge Student Fellowship Program*

### **Service to Boston College**

2019– EESC Graduate Program Director  
2019– Faculty Task Force for Engineering  
2018– Research Administration Improvement Initiative  
2018–2019 EESC Departmental Colloquium Series, Organizer  
2018–2019 EESC Graduate Program Committee, member

### **Service to WHOI**

2017–2018 Chair, Joint Committee for Marine Geology & Geophysics (Education Program)  
2017–2018 Promotion/Mentoring Committee for Yang Liao  
2015–2018 WHOI High Performance Computing (Scylla) Advisory Council  
2013–2018 Promotion/Mentoring Committee for Veronique Le Roux  
2017 G&G Staff Position (Petrology & Geochemistry) Search Committee  
2015–2017 Joint Committee for Marine Geology & Geophysics (Education Program)  
2016 G&G Staff Position (Fluid Flow) Search Committee  
2014–2015 Promotion/Mentoring Committee for Horst Marschall  
2013 Dalio Explore Fund Panel Reviewer  
2012–2014 Defined Contribution Retirement Plan Advisory Committee  
2009–2011 Joint Committee for Marine Geology & Geophysics (Education Program)  
2009–2011 Promotion/Mentoring Committee for Yajing Liu  
2010 G&G Staff Position (Metamorphic Petrology) Search Committee  
2009–2010 Office of Applied Oceanography Advisory Committee  
2009 Promotion Committee for Alison Shaw  
2008 G&G Staff Position (Fluid Flow) Search Committee  
2008 G&G Department Chair Search Committee

### **Educational Activities**

Advising: Gina Applebee (WHOI Summer Student Fellow, 2007), Jennifer Barry (WHOI Summer Student Fellow, 2005), Robert Bialas (Ph.D., 2009, External Examiner; LDEO), Stephanie Brown (Ph.D., 2019, committee member; MIT), Claire Bucholz (Ph.D., 2016, Generals Project advisor and committee member; MIT/WHOI), Fiona Clerc (WHOI Guest Student, 2016; MIT/WHOI Joint Program Student, primary advisor), Min Ding (Ph.D. 2015, committee member; MIT/WHOI), Jimmy Elsenbeck (M.Sc., 2007, co-advisor; MIT/WHOI), Patricia Gregg (Ph.D., 2008, co-advisor; MIT/WHOI), Yoshi Kaneko (WHOI Postdoctoral Investigator, co-advisor), Ben Klein (Ph.D., 2018, committee member; MIT), Michael Krawczynski (Ph.D., 2011, Generals Project advisor and committee member; MIT/WHOI), Ben Mandler (Ph.D., 2016, committee member; MIT),

Hannah Mark (Ph.D., 2019, co-advisor; MIT/WHOI), Nathan Miller (Ph.D., 2013, Generals Project advisor and committee member; MIT/WHOI), Jean-Arthur Olive (Ph.D., 2015, primary advisor; MIT/WHOI), Joshua Rines (M.S. candidate, primary advisor; BC), Emily Roland (Ph.D. 2011, Generals Project advisor and committee member; MIT/WHOI), Gilles Seropian (WHOI Summer Student Fellow, 2015), William Shinevar (WHOI Summer Student Fellow, 2014; MIT/WHOI Joint Program Student, co-advisor), Paris Smalls (MIT/WHOI Joint Program Student, generals project advisor), Laura Stevens (Ph.D., 2017, co-advisor; MIT/WHOI), Christy Till (Ph.D., 2011, committee member; MIT), Ikuko Wada (MARGINS Postdoctoral Fellow, co-advisor), Dorsey Wanless (WHOI Postdoctoral Scholar, co-advisor), Nan Zhang (WHOI Postdoctoral Investigator, advisor)

Teaching: EESC1168 *Environmental Geosciences: Earth Processes & Risks* (BC, Fall 2018), EESC2208 *Environmental Systems: Quantitative Methods* (BC, Fall 2019), 12.521 *Computational Geodynamics* (MIT/WHOI, 2009, 2011, 2014, 2016), 12.718 *Kinetics and Mass Transport* (MIT/WHOI, 2015), 12.751/12.754 *Seminar in Presenting Scientific Research* (MIT/WHOI, 2006–2014), 12.753 *Geodynamics Seminar* (MIT/WHOI, 2006, 2010, 2017), GEOL2910G *Dynamics of Ice Sheets & Glaciers* (Brown University, 2013)

## Funded Research

NSF OPP-18-38410, 10/1/2019–9/30/2021, \$211,405, *Collaborative Research: Using seismic tremor to constrain seasonal variations in subglacial hydrology at the bed of the Greenland ice sheet*, Principal Investigator.

NSF OCE-19-28776, 8/15/2019–7/31/2022, \$304,473, *Collaborative Research: Tectono-magmatic Controls on the Origin and Evolution of Mid-Ocean Ridge Segmentation at Slow-to-Intermediate Spreading Rates - Top down or bottom up*, Principal Investigator.

NSF EAR-18-55430, 7/1/2019–6/30/2022, \$236,345, *Collaborative Research: Voyage to the bottom of Arcs: interplay between water, deformation, and lower crustal stability*, co-Principal Investigator.

Southern California Earthquake Center (SCEC) Award #19075, 2/1/2019–1/31/2020, \$15,001, *The role of shear zones on the rheology of Southern California*, co-Principal Investigator.

NSF EAR-18-52680, 4/1/2019–3/31/2022, \$79,579, *Collaborative Research: Melange-peridotite Interactions in the Source of Arc Magmas*, co-Principal Investigator.

NSF OCE-18-33279, 9/15/2018–9/14/2021, \$532,675, *Collaborative Research: Capturing 4D Variations in Stress, Slip, and Fault-Zone Material Properties: The 2019-2021 Gofar Transform Fault Earthquake Prediction Experiment*, co-Principal Investigator.

Southern California Earthquake Center (SCEC) Award #18156, 7/1/2018–4/30/2019, \$14,500, *Incorporating the effects of hydrous phases and strain localization into seismic-velocity-based models for the Community Rheology Model*, co-Principal Investigator.

Southern California Earthquake Center (SCEC) Award #17202, 5/1/2017–4/30/2018, \$14,500, *Integrating Seismic Velocity Data and Experimental Flow Laws into the Community Rheology Model*, co-Principal Investigator.

NSF EAR-17-14909, 8/1/2017–7/31/2021, \$1,751,580, *Collaborative Research: Interactions Between Incipient Continental Rifting, Fluvial Systems, and Regional Climate in Southern Africa: The Okavango-Makgadikgadi Complex, Botswana*, co-Principal Investigator.

NSF EAR-17-22932 (EAR-18-44340 @ Boston College), 7/1/2017–6/30/2020, \$124,557, *Collaborative Research: Relating Bulk Composition to Seismic Properties in Crustal Rocks*, Principal Investigator.

Deep Carbon Observatory, Sloan Foundation, \$46,250, *Modeling global carbon fluxes between Earth's upper and lower mantle*, Principal Investigator.

WHOI IR&D Award, 4/15/2017–9/30/2017, \$79,683, *Characterizing the Seismic Behavior of Oceanic Normal Faults*, Principal Investigator.

NSF EAR-16-50244 (EAR-19-03897 @ Boston College), 2/1/2017–1/31/2019, \$218,477, *Collaborative Research: Quantifying the Sensitivity of Rifting Processes to Erosion and Sedimentation*, Principal Investigator.

WHOI Ocean and Climate Change Institute, 8/1/2016–7/31/2018, \$74,947, *Turning Greenland upside down: A coupled observational-modeling approach to understanding the puzzling response of ice sheet flow to meltwater variability*, co-Principal Investigator.

NSF EAR-16-24109, 8/1/2016–7/31/2018, \$121,877, *Collaborative Research: The Role of Rock Composition and Microstructural Evolution on Strain Localization and the Effective Viscosity of the Crust*, Principal Investigator.

WHOI IR&D Award, 5/1/2016–9/15/2016, \$95,047, *Grain Size Evolution in Ice Sheets and Glaciers*, Principal Investigator.

Southern California Earthquake Center (SCEC) Award #16106, 2/1/2016–1/31/2017, \$12,000, *Rheological mixing laws for application to the community rheology model*, co-Principal Investigator.

NSF EAR-15-51023 (EAR-18-41806 @ Boston College), 2/1/2016–1/31/2019, \$79,019, *Collaborative Research: Characterizing and Modeling Crustal Recycling*, Principal Investigator.

WHOI IR&D Award, 5/1/2015–9/15/2015, \$96,329, *Does Seafloor Bathymetry Record Sea Level Changes?*, Principal Investigator.

NSF OCE-14-58201, 9/1/2015–8/31/2018, \$221,359, *Collaborative Research: Developing a New Model to Investigate the Dynamics of Melt Generation beneath Mid-Ocean Ridges*, Principal Investigator.

Deep Carbon Observatory, Sloan Foundation, \$40,000, *Deriving global mid-ocean ridge CO<sub>2</sub> fluxes from coupled petrologic-geodynamic models of MORB melting*, Principal Investigator.

NSF EAR-13-16333, 8/1/2013–7/31/2016, \$240,000, *Collaborative Research: 3D Dynamics of Buoyant Diapirs in Subduction Zones*, Principal Investigator.

NSF OCE-11-54238, 4/1/2012–3/30/2015, \$276,368, *Collaborative Research: 3D geodynamic models of tectono-magmatic extension at mid-ocean ridges: Variations in magmatism, faulting, and morphology at the segment scale*, Principal Investigator.

WHOI Deep Ocean Exploration Institute, 9/15/2011–9/30/2013, \$63,578, *Ridge Jumps in 3D – Developing a New Numerical Tool to Examine the Dynamics of Mantle-Lithosphere Interaction*, Co-Principal Investigator.

NSF OCE-10-61203, 3/1/2011–2/28/2013, \$258,077, *Frictional behavior of oceanic transform faults and influence on earthquake characteristics*, Co-Principal Investigator.

NSF EAR-10-10432, 5/1/11–4/30/2018, \$2,812,076, *Collaborative Research: Integrated studies of early stages of continental extension: From incipient (Okavango) to young (Malawi) rifts*, Co-Principal Investigator.

WHOI Ocean and Climate Change Institute, 9/1/2010–8/31/2012, \$58,413, *Influence of basal meltwater on the time-integrated sliding behavior of the Greenland Ice Sheet*, Principal Investigator.

- NSF ARC-10-23364, 9/1/2010–8/31/2013, \$794,583, *Collaborative Research: The influence of hydrofracture and surface melt variability on Greenland Ice Sheet flow*, Co-Principal Investigator.
- NSF EAR-09-48666, 5/1/2010–4/30/2013, \$477,066, *Experimental investigation of the link between water loss and oxygen fugacity in olivine-hosted melt inclusions*, Co-Principal Investigator.
- WHOI Ocean Ridge Initiative, 9/1/2009–8/31/2010, \$3,937, *Effects of magma supply on normal fault evolution and eruption dynamics along the Galápagos Spreading Center*, Principal Investigator.
- NSF EAR-08-54673, 8/1/2009–7/31/2012, \$265,876, *CSEDI Collaborative Research: Influence of grain-size evolution on global and regional mantle flow and upper mantle seismic structure*, Principal Investigator.
- NSF OCE-08-40800, 6/15/2009–6/14/2011, \$166,739, *MARGINS Postdoctoral Fellowship: A synthesis of the physical state of the mantle wedge in Costa Rica-Nicaragua and Izu-Bonin-Mariana*, Principal Investigator (Postdoctoral Fellow is Ikuko Wada).
- WHOI Deep Ocean Exploration Institute, 6/1/2008–5/31/2010, \$58,762, *Shallow melt migration and the creation of crustal thickness variations at mid-ocean ridges*, Co-Principal Investigator.
- WHOI Interdisciplinary Award, 7/1/2007–6/30/2009, \$59,344, *The effect of water on volcanic arc magmagenesis: Integrating geochemical data with geodynamic models*, Co-Principal Investigator.
- NSF OCE-06-49103, 4/1/2007–3/31/2009, \$315,045, *Geodynamics and melting at ultraslow and oblique spreading centers*, Co-Principal Investigator.
- NSF EAR-06-52707, 6/1/2007–5/31/2009, \$365,233, *Collaborative Research: CSEDI—The dynamics of plume-trench interaction: Samoa-Tonga*, Co-Principal Investigator.
- NSF OCE-07-05964, 3/1/2007–2/28/2009, \$578,663, *Acquisition of gyro-stabilized BGM-3 gravimeters for academic science and implementation on UNOLS vessels*, Co-Principal Investigator.
- WHOI Ocean and Climate Institute, 2/1/07–1/31/09, \$180,244, *Feedbacks between Arctic climate change and glacial ice discharge*, Co-Principal Investigator.
- NSF OCE-06-23188, 8/1/06–7/31/08, \$150,310, *Thermo-mechanical behavior of oceanic transform faults*, Principal Investigator.
- NSF OCE-MARGINS-05-48672, 3/15/06–3/14/08, \$83,000, *Collaborative Research: The influence of magmatism on the evolution of continental rifts*, Principal Investigator.
- NSF EAR-05-09882, 6/1/2005–12/31/2006, \$81,482, *Mantle flow and the development of sub-lithospheric seismic anisotropy*, Principal Investigator.
- NSF OCE-03-27018, 1/1/2004–12/31/2005, \$40,224, *Collaborative Research: Integrated petrological, geophysical, and numerical modeling constraints on crustal and mantle processes along the Galápagos Spreading Center*, Co-Principal Investigator.
- WHOI Deep Ocean Exploration Institute, 7/1/2005–6/30/2007, *A seafloor geodetic experiment to monitor deformation on the slope of Kilauea Volcano, Hawai'i*, \$69,995, Co-Principal Investigator.
- WHOI Interdisciplinary Award, 7/1/2005–6/30/2007, \$49,600, *Water-filled fracture propagation in subfreezing ice: New insights from rock mechanics and implications for rapid ice sheet response to climate change*, Co-Principal Investigator.

## Sea and Field Experience

- 2019 co-Chief Scientist, Deployment of broad band seismometers and dredging on the Gofar Transform Fault, East Pacific Rise
- 2017 Chief Scientist, Seafloor mapping across the N. Mid-Atlantic Ridge
- 2013–2014 Controlled source seismic experiment across the Okavango Delta, Botswana.
- 2007–2014 Deployment of geophysical instruments (GPS, seismometers, pressure sensors) to monitor seasonal drainage of two lakes around Jakobshavn Isbrae in western Greenland, 8 spring/summer field seasons.
- 2010 Shipboard scientist, Seafloor mapping along the western Galapagos spreading center (92–95°W) using Alvin, AUV Sentry, and CameraTow systems, R/V Atlantis.
- 2005 Shipboard geophysicist, Deployment of an acoustic extensometer array on the southeast flank of Kilauea volcano, Hawai'i, R/V Kilo Moana.
- 2000 Shipboard geophysicist, Ocean-bottom seismic refraction and multi-channel seismic reflection study of the interactions between the Galápagos hotspot and Cocos-Nazca spreading center.
- 1997 Shipboard geophysicist, NOBEL towed-source seismic refraction experiment of the shallow crustal structure of the Mid-Atlantic Ridge, R/V Ewing.

## Invited Keynote and Plenary Talks

(Titles listed in “Presented Papers with Published Abstracts”)

- 2018 Invited speaker, *Topographic controls on magmatism during rifting*, 2018 Joint Meeting of the Canadian Geophysical Union and the Computational Infrastructure for Geodynamics, Niagara Falls, Canada.
- 2015 Keynote speaker, SERC/Mathworks Workshop: *Teaching Geoscience with MATLAB®*, Carleton College, Northfields, MN
- 2015 Invited speaker, DCO Workshop: *Toward a 4D Planetary Carbon Model*, Smithsonian Institute, Washington, DC
- 2014 Invited speaker, Deep Carbon Observatory Workshop, DTM, Washington, DC
- 2014 Keynote speaker, Continental Rifting and the Corinth Rift Workshop, Athens, Greece
- 2013 Keynote speaker, *Understanding the Lower Continental Crust: Where we are now*, Goldschmidt Conference, Florence, Italy
- 2012 Invited Session Chair, Rock Deformation Gordon Research Conference, Proctor Academy, NH
- 2011 Invited talk, American Mathematical Society, College of the Holy Cross, MA
- 2010 Invited talk, Margins Successor Planning Workshop, San Antonio, TX
- 2009 2 Invited talks, Fall AGU, San Francisco, CA
- 2009 Keynote speaker, MARGINS RCL Synthesis Workshop, Charleston, SC
- 2007 Invited talk, Fall AGU, San Francisco, CA
- 2006 Keynote speaker, GSA Penrose Conference, *Arc Genesis and Crustal Evolution*, Valdez, Alaska
- 2005 Invited talk, Fall AGU, San Francisco, CA
- 2005 Invited talk, Earthscope National Meeting, Santa Ana Pueblo, New Mexico

2004 Invited talk, Fall AGU, San Francisco, CA

### **Invited Departmental Talks**

2017 Department of Earth & Environmental Sciences, Boston College  
2017 COG<sub>3</sub>, Massachusetts Institute of Technology  
2017 Solid Earth Geophysics Seminar, Harvard University  
2017 GSO Speaker Series, University of Rhode Island  
2016 Department of Earth & Planetary Sciences, Washington University, St. Louis  
2016 Department of Geosciences, Boise State University  
2016 University of Texas Institute for Geophysics, Jackson School for Geophysics  
2016 ERL-FISH Seminar, Massachusetts Institute of Technology  
2015 Department of Earth Science, University of Minnesota  
2015 Department of Earth and Environmental Sciences, University of Pennsylvania  
2014 GSO Speaker Series, University of Rhode Island  
2014 Department of Geological Science, Brown University  
2014 Department of Physics, University of Colorado Boulder  
2014 Department of Earth Science, University of California, Santa Barbara  
2013 Department of Earth Sciences Lecture Series, Oxford University  
2013 Departmental Seminar, National Oceanography Centre, University of Southampton  
  
2012 Department of Earth Sciences Colloquium, University of New Hampshire  
2011 Colloquium to the Department of Geological Sciences, Brown University  
2010 EPS Colloquium, Harvard University  
2010 Geodynamics Seminar Series, LDEO, Columbia University  
2009 Department of Earth & Ocean Sciences Lecture, Univ. South Carolina, Columbia  
  
2009 COAS MG&G Seminar, Oregon State University  
2009 Department of Terrestrial Magnetism, Carnegie Institution of Washington  
2009 EAPS Distinguished Lecture Series, Massachusetts Institute of Technology  
2008 DES Colloquium, Boston University  
2008 SOEST, University of Hawaii  
2008 Department of Geology, Bates College  
2006 Department of Terrestrial Magnetism, Carnegie Institution of Washington.  
2006 Geophysics Brown Bag Seminar, Brown University  
2004 Graduate School of Oceanography, University of Rhode Island  
2004 Department of Geophysical Sciences, University of Chicago



## Manuscripts Currently Submitted or In Press

(\*denotes student advisee first author; + denotes post-doc advisee first author)

- Mark, H.F., J.A. Collins, D. Lizarralde, G. Hirth, J.B. Gaherty, R.L. Evans, and **M.D. Behn**, Constraints on the depth, thickness, and strength of the G discontinuity in the central Pacific from S receiver functions, *J. Geophys. Res.* (submitted December 2019).
- Brown, S.M., **M.D. Behn**, and T.L. Grove, U-series disequilibria in basalts generated by shallow spinel and plagioclase field mantle melting, *Earth Planet. Sci. Lett.* (submitted December 2019).
- Lai, C.-Y., L.A. Stevens, D.L. Chase, T.T. Creyts, **M.D. Behn**, S.B. Das, and H.A. Stone, Seasonally evolving bed permeability of the Greenland Ice Sheet, *Science* (submitted October 2019).
- Liu, Y., J.J. McGuire, and **M.D. Behn**, Aseismic transient slip on Gofar Transform Fault, East Pacific Rise, *Proc. Nat. Acad. Sci.* (in revision).
- +Zhang, N., **M.D. Behn**, E.M. Parmentier, and C. Kincaid, Melt Segregation during Ascent of Buoyant Diapirs in Subduction Zones, *J. Geophys. Res. – Solid Earth* (in revision).
- \*Zhang, X., J. Lin and **M.D. Behn**, Melt Melting processes in the South China Sea: Constrains from seismically-determined crustal thickness and lava major element compositions, *J. Geophys. Res. – Solid Earth* (in revision).
- \*Shinevar, W.J., H.F. Mark, F. Clerc, E.A. Codillo, J. Gong, J.-A. Olive, S.M. Brown, P.T. Smalls, Y. Liao, V. Le Roux, and **M.D. Behn**, Causes of oceanic crustal thickness oscillations along a 100-Myr Mid-Atlantic Ridge flow line, *Geochem., Geophys., Geosys.* (in press)

## Publications in Refereed Journals or Books

(\*denotes student first author; + denotes post-doc first author)

- \*Clerc, F., B.M. Minchew, and **M.D. Behn**, 2019, Marine ice cliff instability mitigated by slow removal of ice shelves, *Geophys. Res. Lett.*, v. 46, doi:10.1029/2019GL084183.
- Howell, S.M., J.-A. Olive, G. Ito, **M.D. Behn**, J. Escartín, and B. Kaus, 2019, Seafloor expression of oceanic detachment faulting reflects gradients in mid-ocean ridge magma supply, *Earth Planet. Sci. Lett.*, v. 516, 176–189, doi:10.1016/j.epsl.2019.04.001.
- \*Mark, H.F., **M.D. Behn**, J.-A. Olive, and Y. Liu, 2018, Controls on mid-ocean ridge normal fault seismicity across spreading rates from rate-and-state friction models, *J. Geophys. Res. – Solid Earth*, v. 123, 6719–6733, doi:10.1029/2018JB015545.
- \*Stevens, L.A., I.J. Hewitt, S.B. Das, and **M.D. Behn**, 2018, Relationship between Greenland Ice Sheet surface speed and modeled effective pressure, *J. Geophys. Res. – Earth Surface*, v. 123, 2258–2278, doi:10.1029/2017JF004581.
- \*Clerc, F., **M.D. Behn**, E.M. Parmentier, and G. Hirth, 2018, Predicting global rates and distribution of carbonate melting: Implications for the seismic structure of the oceanic upper mantle, *Geophysical Research Letters*, v. 45, 6944–6953, doi:10.1029/2018GL078142. [Editors Highlight in *Eos*; August 17, 2018]
- \*Shinevar, W.J., **M.D. Behn**, G. Hirth, and O. Jagoutz, 2018, Inferring Crustal Viscosity from Seismic Velocity: Application to the Lower Crust of Southern California, *Earth Planet. Sci. Lett.*, v. 494, 83–91, doi:10.1016/j.epsl.2018.04.055.
- Turner, A.J., R.F. Katz, **M.D. Behn**, and T. Keller, 2017, Magmatic focusing to mid-ocean ridges: the role of grain size variability and non-Newtonian viscosity, *Geochem., Geophys., Geosys.*, v. 18, 4342–4355, doi:10.1002/2017GC007048.

- Wolfson-Schwehr, M., M.S. Boettcher, and **M.D. Behn**, 2017, Thermal segmentation of mid-ocean ridge transform faults, *Geochem., Geophys., Geosys.*, v. 18, 3405–3418, doi:10.1002/2017GC006967.
- Wanless, V.D. and **M.D. Behn**, 2017, Spreading rate-dependent variations in crystallization beneath mid-ocean ridges, *Geochem., Geophys., Geosys.*, v. 18, 3016–3033, doi:10.1002/2017GC006924.
- Klein, B.Z., O. Jagoutz, and **M.D. Behn**, 2017, Archean crustal compositions promote full mantle convection, *Earth Planet Sci. Lett.*, v. 474, 516–526, doi:10.1016/j.epsl.2017.07.003.
- Bai, H., L.G.J. Montési, and **M.D. Behn**, 2017, MeltMigrator: a MATLAB-based Software for Modeling Three-dimensional Melt Migration and Crustal Thickness Variations at Mid-Ocean Ridges Following a Rules-Based Approach, *Geochem., Geophys., Geosys.*, v. 18, 445–456, doi:10.1002/2016GC006686.
- \*Stevens, L.A., **M.D. Behn**, S.B. Das, I. Joughin, B.P.Y. Noël, M.R. van den Broeke, and T. Herring, 2016, Greenland Ice Sheet flow response to runoff variability, *Geophys. Res. Lett.* v. 43, 11,295–11,303, doi:10.1002/2016GL070414.
- Howell, S.M., G. Ito, **M.D. Behn**, F. Martinez, J.-A. Olive, and J. Escartín, 2016, Magmatic and tectonic extension at the Chile Ridge: Evidence for mantle controls on ridge segmentation, *Geochem., Geophys., Geosys.*, v. 17, 2354–2373, doi:10.1002/2016GC006380.
- \*Olive, J.-A., **M.D. Behn**, G. Ito, W.R. Buck, J. Escartín, and S. Howell, 2016, Response to Comment on “Sensitivity of seafloor bathymetry to climate-driven fluctuations in mid-ocean ridge magma supply” by Tolstoy, *Science*, v. 353, 229 doi: 10.1126/science.aaf2022.
- \*Olive, J.-A., **M.D. Behn**, G. Ito, W.R. Buck, J. Escartín, and S. Howell, 2016, Response to Comment on “Sensitivity of seafloor bathymetry to climate-driven fluctuations in mid-ocean ridge magma supply” by Huybers et al., *Science*, v. 352, 1405 doi: 10.1126/science.aaf2021.
- \*Olive, J.-A., **M.D. Behn**, E. Mittelstaedt, G. Ito, and B.Z. Klein, 2016, The role of elasticity in simulating long-term tectonic extension, *Geophys. J. Int.*, v. 205, 728–743, doi:10.1093/gji/ggwo44.
- Kelemen, P.B. and **M.D. Behn**, 2016, Formation of lower continental crust by relamination of buoyant arc lavas and plutons, *Nature Geosci.*, v. 9, 197–205, doi:10.1038/NGEO2662.
- +Wada, I. and **M.D. Behn**, 2015, Focusing of upward fluid migration beneath the arc: Effect of mineral grain size variation in the mantle wedge, *Geochem., Geophys., Geosys.*, v. 16, 3905–3923, doi:10.1002/2015GC005950.
- \*Shinevar, W.J., **M.D. Behn**, and G. Hirth, 2015, Compositional dependence of lower crustal viscosity, *Geophys. Res. Lett.*, v. 42, 8333–8340, doi:10.1002/2015GL065459.
- \*Olive, J.-A., **M.D. Behn**, G. Ito, W.R. Buck, J. Escartín, and S. Howell, 2015, Sensitivity of seafloor bathymetry to climate-driven fluctuations in mid-ocean ridge magma supply, *Science*, v. 350, 310–313, doi:10.1126/science.aado715.
- Behn, M.D.** and T.L. Grove, 2015, Melting systematics in mid-ocean ridge basalts: Application of a plagioclase-spinel melting model to global variations in major element chemistry and crustal thickness, *J. Geophys. Res.*, v. 120, 4863–4886, doi:10.1002/2015JB011885.
- \*Stevens, L.A., **M.D. Behn**, J.J. McGuire, S.B. Das, I. Joughin, T. Herring, D.E. Shean, M.A. King, 2015, Hydrologically Induced Basal Slip Triggers Greenland Supraglacial Lake Drainages, *Nature*, v. 522, 73–76, doi:10.1038/nature14480.

- \*Zhou, Z., J. Lin, **M.D. Behn**, and J.-A. Olive, 2015, Mechanism for normal faulting in the subducting plate at the Mariana trench, *Geophys. Res. Lett.*, v. 42, 4309–4317, doi:10.1002/2015GL063917.
- Whitehead, J.A., and **M.D. Behn**, 2015, The continental drift convection cell, *Geophys. Res. Lett.*, v. 42, 4301–4308, doi:10.1002/2015GL064480.
- Carmichael, J.D., I. Joughin, **M.D. Behn**, S. Das, M.A. King, L. Stevens, D. Lizarralde, 2015, Seismicity on the Western Greenland Ice Sheet: Surface Fracture in the Vicinity of Active Moulins, *J. Geophys. Res., Earth Surf.*, v. 120, 1082–1106, doi:10.1002/2014JF003398.
- Hacker, B.R., P.B. Kelemen, **M.D. Behn**, 2015, Continental lower crust, *Ann. Rev. Earth Planet. Sci.*, v. 43, 6.1–6.39, doi:10.1146/annurev-earth-050212-124117.
- Turner, A.J., R.F. Katz, and **M.D. Behn**, 2015, Grain-size dynamics beneath mid-ocean ridges: Implications for permeability and melt extraction, *Geochem., Geophys., Geosys.* v. 16, 925–946, doi:10.1002/2014GC005692.
- +Wanless, V.D., A.M. Shaw, **M.D. Behn**, S.A., Soule, J. Escartin, and C. Hamelin, 2015, Magmatic plumbing at Lucky Strike Volcano based on the composition of olivine-hosted melt inclusion compositions, *Geochem., Geophys., Geosys.*, v. 16, 126–147, doi:10.1002/2014GC005517.
- Poinar, K., I. Joughin, S.B. Das, **M.D. Behn**, J.T.M. Lenaerts, and M.R. van den Broeke, 2015, Limits to future expansion of surface-melt-enhanced ice flow into the interior of western Greenland, *Geophys. Res. Lett.*, 42, 1800–1807, doi:10.1002/2015GL063192.
- Nielsen, S.G., N. Shimizu, C.-T.A. Lee, and **M.D. Behn**, 2014, Chalcophile behavior of thallium during MORB melting and implications for the sulfur content of the mantle, *Geochem., Geophys., Geosys.*, v. 15, doi:10.1002/2014GC005536.
- \*Olive, J.-A., **M.D. Behn**, and L.C. Malatesa, 2014, Modes of extensional faulting controlled by surface processes, *Geophys. Res. Lett.*, v. 41, 6725–6733, doi:10.1002/2014GL061507.
- +Wanless, V.D., **M.D. Behn**, A.M. Shaw, and T. Plank, 2014, Variations in melting dynamics and mantle composition in the Eastern Volcanic Zone of the Gakkel Ridge: insights from olivine-hosted melt inclusions, *Contrib. Min. Petrol.*, v. 167, 1005, doi:10.1007/s00410-014-1005-7.
- \*Olive, J.-A., and **M.D. Behn**, 2014, Rapid rotation of normal faults due to flexural stresses: An explanation for the global distribution of normal fault dips, *J. Geophys. Res.*, v. 119, 3722–3739, doi:10.1002/2013JB010512.
- \*Olive, J.-A., F. Pearce, S. Rondenay, and **M.D. Behn**, 2014, Pronounced zonation of seismic anisotropy in the Western Hellenic subduction zone and its geodynamic significance, *Earth Planet. Sci. Lett.*, v. 391, 100–109.
- Jagoutz, O. and **M.D. Behn**, 2013, Foundering of lower island-arc crust as an explanation for the origin of the continental Moho, *Nature*, v. 504, 131–134, doi:10.1038/nature12758.
- Joughin, I., S.B. Das, G.E. Flowers, **M.D. Behn**, R.B. Alley, M.A. King, B.E. Smith, J. Bamber, M.R. van den Broeke, and J.H. van Angelen, 2013, Influence of supraglacial lakes and ice-sheet geometry on seasonal ice-flow variability, *The Cryosphere*, v. 7, 1185–1192, doi:10.5194/tc-7-1185-2013.
- \*Bucholz, C.E., G.A. Gaetani, **M.D. Behn**, N. Shimizu, and M. Newville, 2013, Post-entrapment modification of volatiles and oxygen fugacity in olivine-hosted melt inclusions, *Earth Planet. Sci. Lett.*, v. 374, 145–155.

- Shillington, D.J., H.J.A. Van Avendonk, **M.D. Behn**, P.B. Kelemen, and O. Jagoutz, 2013, Constraints on the composition of the Aleutian arc lower crust from Vp/Vs, *Geophys. Res. Lett.*, v. 40, 2579-2584, doi:10.1002/grl.50375.
- +Wada, I., **M.D. Behn**, and A.M. Shaw, 2012, Effects of heterogeneous hydration in the incoming plate, slab rehydration, and mantle wedge hydration on slab-derived H<sub>2</sub>O flux in subduction zones, *Earth Planet. Sci. Lett.*, v. 353-354, 60-71.
- Colman, A., J. Sinton, S.M. White, T. McClinton, J. Bowles, K. Rubin, **M.D. Behn**, B. Cushman, D. Eason, T.K.P. Gregg, K. Grönvold, S. Hidalgo, J. Howell, O. Niell, and C. Russo, 2012, Effects of variable magma supply on mid-ocean ridge eruptions: Constraints from mapped lava flow fields along the Galápagos Spreading Center, *Geochem., Geophys., Geosys.*, v. 13, Q08014, doi:10.1029/2012GC004163.
- \*Miller, N.C. and **M.D. Behn**, 2012, Timescales for the growth of sediment diapirs in subduction zones, *Geophys. J. Int.*, v. 190, 1361-1377.
- McGuire, J.J., J.A. Collins, P. Gouédard, E. Roland, D. Lizarralde, M.S. Boettcher, **M.D. Behn**, and R.D. van der Hilst, 2012, Variations in earthquake rupture properties along the Gofar transform fault, East Pacific Rise, *Nature Geosci.*, v. 5, 336-341.
- Liu, Y., J.J. McGuire, and **M.D. Behn**, 2012, Frictional behavior of oceanic transform faults and its influence on earthquake characteristics, *J. Geophys. Res.*, v. 117, B04315, doi:10.1029/2011JB009025.
- Shaw, A.M., E.H. Hauri, **M.D. Behn**, D.R. Hilton, C.G. Macpherson, and J.M. Sinton, 2012, Long-term preservation of slab signatures in the mantle inferred from hydrogen isotopes, *Nature Geosci.*, v. 5, 224-228.
- Freed, A.M., G. Hirth, and **M.D. Behn**, 2012, Using short-term postseismic displacements to infer ambient deformation conditions of the upper mantle, *J. Geophys. Res.*, v.117, B01409, doi:10.1029/2011JB008562.
- Whitehead, J.A., E. Shea, and **M.D. Behn**, 2011, Cellular convection in a chamber with a warm surface raft, *Physics of Fluids*, v. 23, 104103, doi:10.1063/1.3651341.
- Montési, L.G.J., **M.D. Behn**, L.B. Hebert, J. Lin, J.L. Barry, 2011, Controls on melt migration and extraction at the ultraslow Southwest Indian Ridge 10°-16°E, *J. Geophys. Res.*, v. 116, B10102, doi:10.1029/2011JB008259.
- +Wada, I., **M.D. Behn**, and J. He, 2011, Grain size distribution in the mantle wedge of subduction zones, *J. Geophys. Res.*, v. 116, B10203, doi:10.1029/2011JB008294.
- Behn, M.D.**, P.B. Kelemen, G. Hirth, B.R. Hacker, and H.-J. Massonne, 2011, Diapirs as the source of the sediment signature in arc lavas, *Nature Geosci.*, v. 4, 641-646.
- Hacker, B.R., P.B. Kelemen, and **M.D. Behn**, 2011, Differentiation of the continental crust by relamination, *Earth Planet. Sci. Lett.*, v. 307, 501-516.
- Brooks, B.A., J.H. Foster, J.J. McGuire, and **M.D. Behn**, 2011, Submarine landslides and slow earthquakes: Monitoring motion with GPS and seafloor geodesy, in *Complexity in Earthquakes, Tsunamis, and Volcanoes, and Forecasting and Early Warning of their Hazards*, Springer Complexity Encyclopedia, edited by W.H.K. Lee, ben-Avraham, D., Havlin, S., Helal, M.A., Sahimi, M., and Marchetti, M.C., 889-907.
- \*Olive, J.-A., **M.D. Behn**, and B.E. Tucholke, 2010, The structure of oceanic core complexes controlled by the depth distribution of magma emplacement, *Nature Geosci.*, v. 3, 491-495.

- \*Roland, E.C., **M.D. Behn**, and G. Hirth, 2010, Thermal-mechanical behavior of oceanic transform faults: Implications for seismicity and hydration of the oceanic upper mantle, *Geochem., Geophys., Geosys.*, v. 11, Q07001, doi:10.1029/2010GC003034.
- Conrad, C.P., and **M.D. Behn**, 2010, Constraints on lithosphere net rotation and asthenospheric viscosity from global mantle flow models and seismic anisotropy, *Geochem., Geophys., Geosys.*, v. 11, Q05W05, doi:10.1029/2009GC002970.
- Shaw, A.M., **M.D. Behn**, S.E. Humphris, R.A. Sohn, and P.M. Gregg, 2010, Deep pooling of low degree melts and volatile fluxes at the 85°E segment of the Gakkel Ridge: Evidence from olivine-hosted melt inclusions and glasses, *Earth Planet. Sci. Lett.*, v. 289, 311–322.
- \*Gregg, P.M., **M.D. Behn**, J. Lin, and T.L. Grove, 2009, Melt generation, crystallization, and extraction beneath segmented oceanic transform faults, *J. Geophys. Res.*, 114, B11102, doi: 10.1029/2008JB006100.
- Behn, M.D.**, G. Hirth, and J.R. Elsenbeck, II, 2009, Implications of grain-size evolution on the seismic structure of the oceanic upper mantle, *Earth Planet. Sci. Lett.*, v. 282, 178–189.
- \*Krawczynski, M.J., **M.D. Behn**, S.B. Das, and I. Joughin, 2009, Constraints on lake volume required for hydrofracture through ice sheets, *Geophys. Res. Lett.*, v. 36, L10501, doi: 10.1029/2008GL036765.
- van Keken, P.E., C. Currie, S.D. King, **M.D. Behn**, A. Cagnioncle, J. He, R. Katz, S.-C. Lin, E.M. Parmentier, M. Spiegelman, K. Wang, 2008, A community benchmark for subduction zone modeling, *Phys. Earth Planet. Inter.*, v. 171, 187–197.
- Behn, M.D.** and G. Ito, 2008, Magmatic and tectonic extension at mid-ocean ridges: 1. Controls on fault characteristics, *Geochem., Geophys., Geosys.*, v. 9, Q08O10, doi: 10.1029/2008GC001965.
- Ito, G. and **M.D. Behn**, 2008, Magmatic and tectonic extension at mid-ocean ridges: 2. Origin of axial morphology, *Geochem., Geophys., Geosys.*, v. 9, Q09O12, doi: 10.1029/2008GC001970.
- Tucholke, B.E., **M.D. Behn**, W.R. Buck, and J. Lin, 2008, The role of melt supply in oceanic detachment faulting and the formation of megamullions, *Geology*, v. 36, 455–458.
- Das, S.B., I. Joughin, **M.D. Behn**, I.H. Howat, M.A. King, D. Lizarralde, and M.P. Bhatia, 2008, Water-driven fracture propagation to the bed of the Greenland Ice Sheet during supraglacial lake drainage, *Science*, v. 320, 778–781.
- Hacker, B.R., L. Mehl, P.B. Kelemen, M. Rioux, **M.D. Behn**, and P. Luffi, 2008, Reconstruction of the Talkeetna intra-oceanic arc of Alaska through thermobarometry, *J. Geophys. Res.*, v. 113, B03204, doi:10.1029/2007JB005208.
- \*Mittlestaedt, E., G. Ito, and **M.D. Behn**, 2008, Mid-ocean ridge jumps associated with hotspot magmatism, *Earth Planet Sci. Lett.*, v. 266, 256–270.
- Silver, P.G. and **M.D. Behn**, 2008, Intermittent plate tectonics?, *Science*, v. 319, 85–88.
- Silver, P.G. and **M.D. Behn**, 2008, Response to Comment on “Intermittent Plate Tectonics?”, *Science*, v. 320, 1291b.
- Montési, L.G.J. and **M.D. Behn**, 2007, Mantle flow and melting at oblique and ultraslow mid-ocean ridges, *Geophys. Res. Lett.*, 34, L24307, doi:10.1029/2007GL031067.
- Behn, M.D.**, G. Hirth, and P.B. Kelemen, 2007, Lower crustal foundering as a mechanism for trench parallel seismic anisotropy below volcanic arcs, *Science*, v. 317, 108–111.
- \*Gregg, P.M., J. Lin, **M.D. Behn**, and L.G.J. Montési, 2007, Spreading rate dependence of the gravity structure of oceanic transform faults, *Nature*, v. 448, 183–187.

- Conrad, C.P., **M.D. Behn**, and P.G. Silver, 2007, Global mantle flow and the development of seismic anisotropy: Differences between the oceanic and continental upper mantle, *J. Geophys. Res.*, v. 112, B07317, doi:10.1029/2006JB004608.
- Behn, M.D.**, M.S. Boettcher, and G. Hirth, 2007, Thermal structure of oceanic transform faults, *Geology*, v. 35, 307–310.
- Behn, M.D.** and P.B. Kelemen, 2006, The stability of arc lower crust: Insights from the Talkeetna Arc section, south-central Alaska and the seismic structure of modern arcs, *J. Geophys. Res.*, v. 111, B11207, doi:10.1029/2006JB004327.
- Behn, M.D.**, W.R. Buck, I.S. Sacks, 2006, Topographic controls on dike injection in volcanic rift zones, *Earth Planet. Sci. Lett.*, v. 246, 188–196.
- Kujawinski, E.B. and **M.D. Behn**, 2006, On the automated analysis of electrospray ionization fourier-transform ion cyclotron resonance mass spectra of natural organic matter, *Analytical Chemistry*, v. 78, 4363–4373.
- Brooks, B.A., J.H. Foster, M. Bevis, L.N. Frazer, and **M.D. Behn**, 2006, Periodic slow earthquakes on the flank of Kilauea volcano, Hawai'i, *Earth Planet. Sci. Lett.*, v. 246, 207–216.
- Silver, P.G., **M.D. Behn**, K. Kelley, M. Schmitz, and B. Savage, 2006, Understanding cratonic flood basalts, *Earth Planet. Sci. Lett.*, v. 245, 190–201.
- Cowie, P., J. Underhill, **M.D. Behn**, J. Lin, and C. Gill, 2005, Spatio-temporal evolution of strain accumulation derived from multi-scale observations of Late Jurassic rifting in the northern North Sea: A critical test of models for lithospheric extension, *Earth Planet. Sci. Lett.*, v. 234, 401–419.
- Behn, M.D.**, J. Lin, and M.T. Zuber, 2004, Effects of hydrothermal cooling and magma injection on mid-ocean ridge temperature structure, deformation, and axial morphology, in *Mid-Ocean Ridges: Hydrothermal Interactions Between the Lithosphere and Oceans*, *Geophys. Monogr. Ser.*, vol. 148, edited by C.R. German, J. Lin, and L.M. Parson, pp. 151–166, AGU, Washington, DC.
- Behn, M.D.**, C.P. Conrad, and P.G. Silver, 2004, Detection of upper mantle flow associated with the African superplume, *Earth Planet. Sci. Lett.*, v. 224, 259–274.
- Behn, M.D.**, J.M. Sinton, and R.S. Detrick, 2004, Effect of the Galápagos Hotspot on seafloor volcanism along the Galápagos Spreading Center (90.9°97.6°W), *Earth Planet. Sci. Lett.*, v. 217, 331–347.
- Behn, M.D.**, and P.B. Kelemen, 2003, The relationship between seismic P-wave velocity and the composition of anhydrous igneous and meta-igneous rocks, *Geochem., Geophys., Geosys.*, v. 4, 1041, doi:10.1029/2002GC000393.
- Sinton, J.M., R.S. Detrick, J.P. Canales, G. Ito, and **M.D. Behn**, 2003, Morphology and segmentation of the western Galápagos Spreading Center, 90.5°98°W: Plume-ridge interaction at an intermediate spreading ridge, *Geochem., Geophys., Geosys.*, v. 4, 8515, doi:10.1029/2003GC000609.
- Behn, M.D.**, J. Lin, and M.T. Zuber, 2002, Evidence for weak oceanic transform faults, *Geophys. Res. Lett.*, v. 29, 2207, doi:10.1029/2002GL015612.
- Behn, M.D.**, J. Lin, and M.T. Zuber, 2002, A continuum mechanics model for normal faulting using a strain-rate softening rheology: Implications for thermal and rheological controls on continental and oceanic rifting, *Earth Planet. Sci. Lett.*, v. 202, pp. 725–740.
- Detrick, R.S., J.M. Sinton, G. Ito, J.P. Canales, **M. Behn**, T. Blacic, B. Cushman, J.E. Dixon, D. Graham, and J. Mahoney, 2002, Correlated geophysical, geochemical and volcanological

manifestations of plume-ridge interaction along the Galápagos Spreading Center, *Geochem., Geophys., Geosys.*, v. 3, doi:10.1029/2002GC000350.

**Behn, M.D.**, J. Lin, and M.T. Zuber, 2002, Mechanisms of normal fault development at mid-ocean ridges, *J. Geophys. Res.*, v. 107, doi:10.1029/2001JB000503.

**Behn, M.D.** and J. Lin, 2000, Segmentation in gravity and magnetic anomalies along the U.S. East Coast passive margin: Implications for incipient structure of the oceanic lithosphere, *J. Geophys. Res.*, v. 105, pp. 25,769–25,790.

**Behn, M.D.** and M.T. Zuber, 2000, A comparison of ocean topography derived from the Shuttle Laser Altimeter -01 and TOPEX/POSEIDON, *IEEE Trans. Geoscience and Remote Sensing*, v. 38, pp. 1425–1438.

**Behn, M.D.**, J.D. Eusden, Jr., and J.A. Notte III, 1998, A three-dimensional gravity model of the southern contact of the Sebago Pluton, Maine, *Canadian Journal of Earth Science*, v. 35, pp. 649–656.

## Presented Papers with Published Abstracts

(\*denotes student/postdoc advisee as first author, † invited presentation)

- Behn, M.D.**, S.M. Howell, J.-A. Olive, G. Ito, J. Escartin, and B. Kaus, 2018, Seafloor expression of oceanic detachment faulting reflects gradients in mid-ocean ridge magma supply, Abstract T32C-02, presented at 2018 Fall Meeting, AGU, Washington, DC, 10–14 December.
- \*†Brown, S.M., **M.D. Behn**, J.-A. Olive, and T. L. Grove, 2018, Chaos at ultraslow and slow spreading ridges: effect of accretion style on basalt compositional variability, T32C-06, presented at 2018 Fall Meeting, AGU, Washington, DC, 10–14 December..
- \*Olive, J.-A., L.C. Malatesta, **M.D. Behn**, and W.R. Buck, 2018, The importance of topographic steady-state for the stability of half-graben structures, Abstract T12B-08, presented at 2018 Fall Meeting, AGU, Washington, DC, 10–14 December.
- \*Shinevar, W.J., H.F. Mark, F. Clerc, E. Codillo, J.-A. Olive, J. Gong, S.M. Brown, P.T. Smalls, Y. Liao, V. Le Roux, and **M.D. Behn**, 2018, Temporal variability of seafloor spreading processes documented along an 80-Myr geophysical transect across the Mid-Atlantic Ridge, T33G-0492, presented at 2018 Fall Meeting, AGU, Washington, DC, 10–14 December..
- Stoner, R.K., **M.D. Behn**, and B.R. Hacker, 2018, Density Foundering of Pamir Lithosphere: Geo- and Thermodynamic Constraints, Abstract V51B-0118, presented at 2018 Fall Meeting, AGU, Washington, DC, 10–14 December.
- \*Zhang, X., J. Lin, and **M.D. Behn**, 2018, Melting processes in the South China Sea: Constrains from seismically determined crustal thickness and lava major element compositions, Abstract T13A-06, presented at 2018 Fall Meeting, AGU, Washington, DC, 10–14 December.
- \*Brown, S.M., **M.D. Behn**, and T. L. Grove, 2018, Addressing an old question with a new model: What are the sources of garnet signatures in MORB?, Goldschmidt Abstracts, 291, Boston, MA, 12-17 August.
- †**Behn, M.D.**, P. Smalls, J.-A. Olive, and W.R. Buck, 2018, Topographic controls on magmatism during rifting, 2018 Joint Meeting of the Canadian Geophysical Union and the Computational Infrastructure for Geodynamics, Niagra Falls, Canada.
- Boettcher, M.S., M. Wolfson-Schwehr, and **M.D. Behn**, 2017, Effects of Segmentation on Mid-Ocean Ridge Transform Faults, T44C-06, presented at 2017 Fall AGU Meeting, New Orleans, LA, 11–15 December.
- \*Brown, S.M., **M.D. Behn**, and T. L. Grove, 2017, Major and trace element modeling of mid-ocean ridge mantle melting from the garnet to the plagioclase stability fields: Generating local and global compositional variability, V43G-02, presented at 2017 Fall AGU Meeting, New Orleans, LA, 11–15 December.
- \*Clerc, F., **M.D. Behn**, E.M. Parmentier, and G. Hirth, 2017, Predicting Global Rates and Distribution of Carbonate Melting Beneath the Ocean Basins: Implications for the Origin of the Gutenberg Discontinuity, D121B-02, presented at 2017 Fall AGU Meeting, New Orleans, LA, 11–15 December.
- \*†Mark, H.F., **M.D. Behn**, J.-A. L. Olive, and Y. Liu, 2017, Geometric and thermal controls on normal fault seismicity from rate-and-state friction models, U13B-19, presented at 2017 Fall Meeting, AGU, New Orleans, LA, 11–15 December.



- \*Shinevar, W.J., **M.D. Behn**, G. Hirth, and O.E. Jagoutz 2017, Inferring Crustal Viscosity from Seismic Wavespeeds: Applications to the Rheologic Structure of the Himalayas, T43B-0681, presented at 2017 Fall AGU Meeting, New Orleans, LA, 11–15 December.
- \*†Stevens, L.A., I. Hewitt, S.B. Das, and **M.D. Behn**, 2017, Temporal variations in the relationship between surface speed and modeled effective pressure on the western margin of the Greenland Ice Sheet, C22A-05, presented at 2017 Fall AGU Meeting, New Orleans, LA, 11–15 December.
- \*Wanless, V.D., and **M.D. Behn**, 2017, Geochemical and thermal constraints on magma storage and crystallization along the global mid-ocean ridge system, Submission 646, presented at IAVCEI 2017 Scientific Assembly, Fostering Integrative Studies of Volcanism, Portland, OR, 14–18 August.
- Behn, M.D.**, D.L. Goldsby, and G. Hirth, 2016, Implications of grain size evolution for the effective stress exponent in ice, C32A-01, presented at 2016 Fall Meeting, AGU, San Francisco, 12–16 December.
- \*Brown, S.M., **M.D. Behn**, A.M. Shaw, and T. L. Grove, 2016, Modeling Major and Trace Element Magma Compositions at Slow and Ultra-Slow Spreading Mid-Ocean Ridges: Implications for Melting in the Garnet Field, T33A-3014, presented at 2016 Fall Meeting, AGU, San Francisco, 12–16 December.
- Howell, S.M., G. Ito, **M.D. Behn**, J.-A. Olive, B. Kaus, A. Popov, E.L. Mittelstaedt, and T. A. Morrow, 2016, Exploring tectonomagmatic controls on mid-ocean ridge faulting and morphology with 3-D numerical models, T33A-3013, presented at 2016 Fall Meeting, AGU, San Francisco, 12–16 December.
- \*Mark, H.F., **M.D. Behn**, J.-A. L. Olive, and Y. Liu, 2016, Seismic coupling at divergent plate boundaries from rate-and-state friction models, T44C-02, presented at 2016 Fall Meeting, AGU, San Francisco, 12–16 December.
- \*Shinevar, W.J., **M.D. Behn**, G. Hirth, and O.E. Jagoutz, 2016, Inferring crustal viscosity structure from seismic velocity data, T52A-03, presented at 2016 Fall Meeting, AGU, San Francisco, 12–16 December.
- \*Zhang, X., J. Lin, and **M.D. Behn**, 2016, Geodynamics of seafloor spreading extinction: Constraints from the South China Sea, OS51C-2076, presented at 2016 Fall Meeting, AGU, San Francisco, 12–16 December.
- †**Behn, M.D.**, T.L. Grove, V.D. Wanless, and S. Brown 2015, Melting Systematics in Mid-ocean Ridge Basalts and Implications for Global CO<sub>2</sub> Fluxes, V31D-3048, presented at 2015 Fall Meeting, AGU, San Francisco, 14–18 December.
- Hacker, B., P.B. Kelemen, and **M.D. Behn**, 2015, Continental Lower Crust: Wavespeeds, Composition, and Relamination, V43D-03, presented at 2015 Fall Meeting, AGU, San Francisco, 14–18 December.
- Howell, S., G. Ito, F. Martinez, J. Escartín, **M.D. Behn**, and J.-A. Olive, 2015, Variations in magmatic and tectonic extension at the Chile Ridge, Abstract V12A-02, presented at 2015 Fall Meeting, AGU, San Francisco, 14–18 December.
- Joughin, I., R. Alley, **M.D. Behn**, S. Das, and G. Flowers, 2015, Seasonal Variation in Basal Shear Stress Beneath the Greenland Ice Sheet, C53E-01, presented at 2015 Fall Meeting, AGU, San Francisco, 14–18 December.
- Kelemen, P.B., **M.D. Behn**, and B. Hacker, 2015, Density Sorting During the Evolution of Continental Crust, V43D-04, presented at 2015 Fall Meeting, AGU, San Francisco, 14–18 December.

- Klein, B., O. Jagoutz, J.-A. Olive, and **M.D. Behn**, 2015, Compositional controls on subjected slab dynamics in the early Earth, DI11A-2570, presented at 2015 Fall Meeting, AGU, San Francisco, 14–18 December.
- \*†Olive, J.-A., **M.D. Behn**, G. Ito, W.R. Buck, J. Escartin, and S. Howell, 2015, Seafloor bathymetry is not a paleoclimate proxy, Abstract V12A-01, presented at 2015 Fall Meeting, AGU, San Francisco, 14–18 December.
- Stevens, L., **M.D. Behn**, S. Das, I. Joughin, M. van den Broeke, T. Herring, and J. McGuire, 2015, The role of meltwater variability in modulating diurnal to inter-annual ice-sheet flow: New insights from a ~decade of high-temporal resolution GPS observations on the western Greenland margin, C43E-06, presented at 2015 Fall Meeting, AGU, San Francisco, 14–18 December.
- Turner, A., R. Katz, and **M.D. Behn**, 2015, Grain Size as a Control for Melt Focusing Beneath Mid-Ocean Ridges, V11B-3062, presented at 2015 Fall Meeting, AGU, San Francisco, 14–18 December.
- \*Wanless, V.D., and **M.D. Behn**, 2015, Crustal accretion along the global mid-ocean ridge system based on basaltic glass and olivine-hosted melt inclusion compositions, V11E-06, presented at 2015 Fall Meeting, AGU, San Francisco, 14–18 December.
- Wolfson-Schwehr, M., M. Boettcher, and **M.D. Behn**, 2015, Scaling Relations for the Thermal Structure of Segmented Oceanic Transform Faults, T23C-2952, presented at 2015 Fall Meeting, AGU, San Francisco, 14–18 December.
- \*†Bucholz, C., G. Gaetani, and **M.D. Behn**, 2014, Modeling Post-Entrapment Modification of Volatile Contents in Olivine-Hosted Melt Inclusions from Mid-Ocean Ridges, Abstract V11C-4731, presented at 2014 Fall Meeting, AGU, San Francisco, 15–19 December.
- Hacker, B., P.B. Kelemen, and **M.D. Behn**, 2014, Relamination and the Differentiation of Continental Crust, Abstract V42B-05, presented at 2014 Fall Meeting, AGU, San Francisco, 15–19 December.
- Liu, Y., J.J. McGuire, and **M.D. Behn**, 2014, Dilatancy Strengthening As a Mechanism for Earthquake Rupture Barriers and Aseismic Creep Transients on Oceanic Transform Faults, Abstract T41B-4623, presented at 2014 Fall Meeting, AGU, San Francisco, 15–19 December.
- \*Olive, J.-A., **M.D. Behn**, and L. Malatesta, 2014, Modes of extensional faulting controlled by surface processes, Abstract T33B-4689, presented at 2014 Fall Meeting, AGU, San Francisco, 15–19 December.
- \*Shinevar, W., **M.D. Behn**, and G. Hirth, 2014, Crustal viscosity structure estimated from multi-phase mixing theory, Abstract T13A-4618, presented at 2014 Fall Meeting, AGU, San Francisco, 15–19 December.
- \*Stevens, L.A., **M.D. Behn**, J.J. McGuire, S.B. Das, I. Joughin, T. Herring, D.E. Shean, M.A. King, 2014, Hydrologically Induced Basal Slip Triggers Greenland Supraglacial Lake Drainages, Abstract C53B-0302, presented at 2014 Fall Meeting, AGU, San Francisco, 15–19 December.
- Turner, A.J., R.F. Katz, and **M.D. Behn**, 2014, Grain-size dynamics beneath mid-ocean ridges: Implications for permeability and melt extraction, Abstract MR23C-4382, presented at 2014 Fall Meeting, AGU, San Francisco, 15–19 December.
- \*Wanless, V.D., **M.D. Behn**, M. Perfit, and D. Clague, 2014, Comparison of Volatile and Major Element Concentrations in Melt Inclusions from Juan de Fuca Ridge Seamounts and the Adjacent Ridge Axis, Abstract V11C-4735, presented at 2014 Fall Meeting, AGU, San Francisco, 15–19 December.

- Whitehead, J.A., and **M.D. Behn**, 2014, The continental drift convection cell, Abstract DI53A-4366, presented at 2014 Fall Meeting, AGU, San Francisco, 15–19 December.
- \*Zhang, N., **M.D. Behn**, E.M. Parmentier, and C. Kincaid, 2014, The Melt Segregation During Ascent of Buoyant Diapirs in Subduction Zones, Abstract V33A-4841, presented at 2014 Fall Meeting, AGU, San Francisco, 15–19 December.
- Sylvia, R.T., C.R. Kincaid, **M.D. Behn**, and N. Zhang, 2014, Laboratory experiments on subduction-induced circulation in the wedge and the evolution of mantle diapirs, Abstract V33B-4840, presented at 2014 Fall Meeting, AGU, San Francisco, 15–19 December.
- Zhou, Z., J. Lin, **M.D. Behn**, and J.-A. Olive, 2014, Mechanism for normal faulting in the subducting plate at the Mariana trench, Abstract T53E-05, presented at 2014 Fall Meeting, AGU, San Francisco, 15–19 December.
- M.D. Behn** and T.L. Grove, 2014, Melting systematics in mid-ocean ridge basalts: Application of a plagioclase-spinel melting model to global variations in major element chemistry and crustal thickness, Geological Society of America, Abstracts with Programs, v. 46(6), p. 196.
- Hacker, B., P.B. Kelemen, and **M.D. Behn**, 2014, Relamination and the Differentiation of Continental Crust, Geological Society of America, Abstracts with Programs, v. 46(6), p. 231.
- Nielsen, S., C.-T. Lee, N. Shimizu, and **M.D. Behn**, 2014, The sulfur abundance of the mantle deduced from trace element ratios, presented at 2014 Goldschmidt, Sacramento, CA June 2014.
- \*†Bucholz, C., G. Gaetani, **M.D. Behn**, N. Shimizu, M. Newville, and B. Monteleone, 2014, Volatile records in olivine-hosted melt inclusions: What can we actually learn from them?, presented at 2014 Goldschmidt, Sacramento, CA June 2014.
- \*Wanless, V.D., A. Shaw, and **M.D. Behn**, 2014, **Invited:** Evidence of accretionary processes at mid-ocean ridges with variable spreading rates based on olivine-hosted melt inclusions, presented at 2014 Goldschmidt, Sacramento, CA June 2014.
- \*Olive, J.-A., E. Mittelstaedt, **M.D. Behn**, and G. Ito, Introducing HiPStER: A new PETSc-based finite-difference / marker-in-cell code for long-term geodynamic simulations, 2014 CIG-EarthScope Institute for Lithospheric Modeling Workshop, Feb 3–4, Tempe, AZ.
- \*Stevens, L.A., **M.D. Behn**, S.B. Das, I.R. Joughin, T. Herring, M.A. King, and J.J. McGuire, 2013, Contrasting ice sheet response to early and late summer rapid supraglacial lake drainage events on the Greenland Ice Sheet, Abstract C43D-02, presented at 2013 Fall Meeting, AGU, San Francisco, 9–13 December.
- \*Wanless, V.D., A.M. Shaw, **M.D. Behn**, and S.A. Soule, 2013, Comparison of Volatile Contents In Melt Inclusions and Glasses at Mid-Ocean Ridges with Variable Spreading Rates, Abstract V31B-2699, presented at 2013 Fall Meeting, AGU, San Francisco, 9–13 December.
- Shillington, D.J., H.J.A. Van Avendonk, **M.D. Behn**, H.A. Janiszewski, G.A., Abers, P.B. Kelemen, and O. Jagoutz, 2013, Combining seismic and geochemical constraints on magmatic processes in the Aleutian arc, Abstract V12B-04, presented at 2013 Fall Meeting, AGU, San Francisco, 9–13 December.
- Das, S.B., **M.D. Behn**, I.R. Joughin, M.A. Fahnestock, J.R. McConnell, L.A. Stevens, F. Straneo, A.J. Plueddemann, and H. Singh, 2013, The fate of Greenland meltwater: Progress and challenges in understanding the influence of surface melt on ice sheet dynamics and runoff in a highly transient hydrologic system, Abstract C44A-01, presented at 2013 Fall Meeting, AGU, San Francisco, 9–13 December.

- Howell, S.M. G. Ito, F. Martinez, **M.D. Behn**, J. Escartín, and J.-A.L. Olive, 2013, Quantifying the variability in tectonic vs. magmatic extension at the Chile Rise, Abstract OS41E-03, presented at 2013 Fall Meeting, AGU, San Francisco, 9–13 December.
- Liu, Y., J.J. McGuire, and **M.D. Behn**, 2013, Oceanic transform fault earthquake nucleation process and source scaling relations – A numerical modeling study with rate-state friction, Abstract S53D-01, presented at 2013 Fall Meeting, AGU, San Francisco, 9–13 December.
- Roland, E.C., J.J. McGuire, D. Lizarralde, **M.D. Behn**, and J.A. Collins 2013, The effect of porosity on fault slip mechanisms at East Pacific Rise transform faults: insight from observations and models at the Gofar Fault, Abstract S53D-03, presented at 2013 Fall Meeting, AGU, San Francisco, 9–13 December.
- †**Behn, M.D.**, P.B. Kelemen, B.R. Hacker, O. Jagoutz, N. Miller, and G. Hirth, 2013, The role of density sorting in the geochemical and geophysical evolution of arc crust, *Geol. Soc. Am., Abstracts with Programs*, v. 45(7), p. 812.
- \*Olive, J.-A. and **Behn, M.D.**, 2013, Rapid rotation of normal faults due to flexural stresses: An explanation for the global distribution of normal fault dips, *Geol. Soc. Am., Abstracts with Programs*, v. 45(7), p. 446.
- Behn M.D.**, T.L. Grove, V.D. Wanless, and A.M. Shaw, 2012, Constraints on the pattern of melt migration beneath mid-ocean ridges based on the major and trace element chemistry of erupted lavas and melt inclusions, Abstract T12D-05, presented at 2012 Fall Meeting, AGU, San Francisco, 3–7 December.
- \*Olive, J.A., **M.D. Behn**, E.L. Mittelstaedt, and G. Ito, 2012, The role of elasticity in normal faulting and the development of axial topography in the oceanic lithosphere, Abstract T43C-2701, presented at 2012 Fall Meeting, AGU, San Francisco, 3–7 December.
- †\*Wada, I., **M.D. Behn**, and A.M. Shaw, 2012, Effects of heterogeneous hydration in the incoming plate, slab rehydration, and mantle wedge hydration on slab-derived H<sub>2</sub>O flux in subduction zones, Abstract T13H-05, presented at 2012 Fall Meeting, AGU, San Francisco, 3–7 December.
- \*Wanless, V.D., A.M. Shaw, and **M.D. Behn**, 2012, Inferences on melting and mantle heterogeneity through analyses of olivine-hosted melt inclusions from the Eastern Volcanic Zone, Gakkel Ridge, Abstract T11F-04, presented at 2012 Fall Meeting, AGU, San Francisco, 3–7 December.
- Wolfson-Schwehr, M.L., M.S. Boettcher, and **M.D. Behn**, 2012, Thermal constraints on the rheology of segmented oceanic transform fault systems, Abstract S21B-2491, presented at 2012 Fall Meeting, AGU, San Francisco, 3–7 December.
- Carmichael, J.D., I.R. Joughin, **M.D. Behn**, S.B. Das, and D. Lizarralde, 2012, Seismic Response of the Greenland Ice-sheet over Several Melt Seasons near Draining Supraglacial Lakes, Abstract C23B-0655, presented at 2012 Fall Meeting, AGU, San Francisco, 3–7 December.
- Kelemen, P.B., **M.D. Behn**, and O. Jagoutz, 2012, Rethinking recycling in arcs, Abstract V31E-04, presented at 2012 Fall Meeting, AGU, San Francisco, 3–7 December.
- van Summeren, J., C.P. Conrad, and **M.D. Behn**, 2012, Grain Size Dependent Viscosity in the Continental Asthenosphere: Implications for Craton Stability, Abstract T33G-2740, presented at 2012 Fall Meeting, AGU, San Francisco, 3–7 December.
- \*Olive, J.A., **M.D. Behn**, E. Mittelstaedt, and G. Ito, 2012, Normal faulting and topography build-up in a visco-plastic vs. elasto-plastic oceanic lithosphere, presented at CIG Mantle Convection and Lithospheric Dynamics Workshop, UC Davis, CA, 29 July – 1 August.

- \*Wanless, V.D., A.M. Shaw and **M.D. Behn**, 2012, Compositional evolution of melts during ascent through the ocean crust based on olivine-hosted melt inclusions, presented at 2012 Goldschmidt Conference, Montreal Canada, 24–29 June.
- Kelemen, P.B., B. Hacker, **M.D. Behn**, and O. Jagoutz, 2012, Ongoing formation of continental crust: Batholiths are forever, presented at 2012 Goldschmidt Conference, Montreal Canada, 24–29 June.
- \*Bucholz, C.E.; G.A. Gaetani, and **M.D. Behn**, 2011, Diffusive Re-equilibration of Volatiles and Oxygen Fugacity in Olivine-Hosted Melt Inclusions: Experiments and Numerical Models, Abstract V11H-02, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5–9 December.
- Das, S.B., **M.D. Behn**, and I.R. Joughin, 2011, Modes of supraglacial lake drainage and dynamic ice sheet response, Abstract C13C-01, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5–9 December.
- Shaw, A.M. and **M.D. Behn**, 2011, Evidence for melt focusing at the Southwest Indian Ridge based on olivine-hosted melt inclusions, Abstract V21B-2497, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5–9 December.
- Freed, A.M., G. Hirth, and **M.D. Behn**, 2011, Using Short-Term Postseismic Displacements to Infer the Ambient Deformation Conditions of the Upper Mantle, Abstract MR24A-02, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5–9 December.
- \*Howell, J., **M.D. Behn**, and S.M. White, 2011, 3D Geodynamic Models of the Stress Field at Oblique-Spreading Mid-Ocean Ridges, Abstract T31A-2324, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5–9 December.
- \*Roland, E.C., J.J. McGuire, J.A. Collins, D. Lizarralde, Y. Liu, and **M.D. Behn**, 2011, Rupture process of oceanic transform faults linked to material variability: local observations and models of the Gofar Fault, EPR, Abstract T31E-03, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5–9 December.
- †Montési, L.G., L.B. Hebert, and **M.D. Behn**, 2011, Segment-Scale Melt Extraction at Mid-Ocean Ridges: A Play in Three Acts, Abstract T32B-02, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5–9 December.
- †\*Wada, I., **M.D. Behn**, and A.M. Shaw, 2011, Slab-derived fluid flux in subduction zones: Effects of localized hydration in the incoming plate and rehydration during subduction, Abstract U51D-05, presented at 2011 Fall Meeting, AGU, San Francisco, CA, 5–9 December.
- \*Wada, I., **M.D. Behn**, E.M. Parmentier, and A.M. Shaw, 2011, Focusing of upward fluid migration due to mineral grain size variation, *Mineralogical Magazine*, Vol. 75 (3), 2106.
- \*Wanless, V.D., A.M. Shaw and **M.D. Behn**, 2011, Crustal accretion on mid-ocean ridges revealed through volatile concentrations in olivine-hosted melt inclusion, *Mineralogical Magazine*, Vol. 75 (3), 2132.
- †\*Olive, J.A., **M.D. Behn**, and B.E. Tucholke, 2010, Oceanic core complex structure controlled by the depth distribution of magma emplacement, Abstract T43B-2017, presented at 2010 Fall Meeting, AGU, San Francisco, CA, 13–17 Dec.
- Whitehead, J.A., E.K. Shea, and **M.D. Behn**, 2010, Cellular convection with a raft, Abstract U51A-0012, presented at 2010 Fall Meeting, AGU, San Francisco, CA, 13–17 Dec.
- Wada, I., **M.D. Behn**, and J. He, 2010, Sharp arc-ward grain size increase in the forearc mantle wedge and its implications for subduction zone dynamics, Abstract T12A-04, presented at 2010 Fall Meeting, AGU, San Francisco, CA, 13–17 Dec.

- Wada, I., K. Wang, **M.D. Behn**, and, A.M. Shaw, 2010, Thermo-petrologic structure of subduction zones and its implications for fluid availability at depth, Abstract MR22A-08, presented at 2010 Fall Meeting, AGU, San Francisco, CA, 13–17 Dec.
- \*Miller, N.C. and **M.D. Behn**, 2010, Growth of sediment diapirs in subduction zones, Abstract T13A-2183, presented at 2010 Fall Meeting, AGU, San Francisco, CA, 13–17 Dec.
- Liu, Y., **M.D. Behn**, and J.J. McGuire, 2010, Frictional behavior of oceanic transform faults and influence on earthquake characteristics, Abstract T33B-2247, presented at 2010 Fall Meeting, AGU, San Francisco, CA, 13–17 Dec.
- White, S.M., J.T. McClinton, J.M. Sinton, K.H. Rubin, A. Colman, J.A. Bowles, **M.D. Behn**, and D.R. Yoerger, 2010, Resolving volcanic eruptions: New fine-scale mapping by AUV Sentry of Galápagos spreading center 92°W and 95°W, Abstract V52A-07, presented at 2010 Fall Meeting, AGU, San Francisco, CA, 13–17 Dec.
- Kelemen, P.B., **M. Behn**, M. Crowley, B.R. Hacker, and H. Massonne, 2010, Bulk composition of UHP metasediments and recycling of the sediment component in arc magmas via diapirs, *Geochim. Cosmo. Acta*, v. 74, n. 11(S), A503.
- †**Behn, M.D.**, W.R. Buck, and W.R. Bialas, 2009, The role of magmatism in rift initiation, *Eos. Trans. AGU*, 90(52), Fall Meet. Suppl., Abstract T24D-05.
- †**Behn, M.D.**, G. Hirth, P.B. Kelemen, and B.R. Hacker, 2009, Implications of sediment diapirs on the H<sub>2</sub>O flux into the mantle at arcs, *Eos. Trans. AGU*, 90(52), Fall Meet. Suppl., Abstract T31D-01.
- Montési, L.G., **M.D. Behn**, M.D. Long, and K.J. Miller, 2009, Trench-parallel anisotropy in subduction zones: Evaluating the contributions of olivine fabric transitions and flow around slab edge in numerical flow models, *Eos. Trans. AGU*, 90(52), Fall Meet. Suppl., Abstract S11A-1692.
- Kincaid, C.R., K.A. Druken, R.W. Griffiths, M.D. Long, **M.D. Behn**, and G. Hirth, 2009, Modeling mantle circulation and density distributions in subduction zones: Implications for seismic studies, *Eos. Trans. AGU*, 90(52), Fall Meet. Suppl., Abstract S14A-04.
- McGuire, J.J., J.A. Collins, E.C. Roland, and **M.D. Behn**, 2009, Seismicity of the Quebrada, Discovery, and Gofar transform faults, *Eos. Trans. AGU*, 90(52), Fall Meet. Suppl., Abstract S52A-07.
- \*†Gregg, P.M., **M.D. Behn**, T.L. Grove, and A.M. Shaw, 2009, Geodynamical and petrological modeling constraints of mantle potential temperature at mid-ocean ridges, *Eos. Trans. AGU*, 90(52), Fall Meet. Suppl., Abstract V21F-04.
- Shaw, A.M., **M.D. Behn**, S.E. Humphris, R.A. Reves-Sohn, and P.M. Gregg, 2009, Evidence for deep pooling of low degree melts from volatile, major, and trace element chemistry of olivine-hosted melt inclusions and glasses from the ultra-slow spreading Gakkel Ridge, *Eos. Trans. AGU*, 90(52), Fall Meet. Suppl., Abstract V42B-02.
- Behn, M.D.**, A.M. Shaw, P.M. Gregg, and T.L. Grove, 2009, Mantle melting beneath the ultra-slow spreading Gakkel Ridge: Insights from melt inclusions and numerical modeling, *Geochim. Cosmo. Acta*, v. 73, n. 13, A103.
- Behn, M.D.**, G. Hirth, and J.R. Elsenbeck, II, 2008, Implications of grain-size evolution on the seismic structure of the oceanic upper mantle, *Eos. Trans. AGU*, 89(53), Fall Meet. Suppl., U41F-07.
- \*Olive, J.A., **M.D. Behn**, B.E. Tucholke, and J. Lin, 2008, Modeling gabbro emplacement during the development of oceanic core complexes, *Eos. Trans. AGU*, 89(53), Fall Meet. Suppl., T43B-2017.

- Hirth, G., **M.D. Behn**, and J. McGuire, 2008, The base of the seismogenic zone in the oceanic lithosphere, *Eos. Trans. AGU*, 89(53), Fall Meet. Suppl., T52A-05.
- Conrad, C.P., and **M.D. Behn**, 2008, Characteristics of asthenospheric flow constrained from models of mantle circulation and observations of seismic anisotropy, *Eos. Trans. AGU*, 89(53), Fall Meet. Suppl., U41F-04.
- Kelemen, P., B. Hacker, **M. Behn**, and S. DeBari, 2008, Distillation of continental crust from above and below, *Eos. Trans. AGU*, 89(53), Fall Meet. Suppl., V22A-01.
- Shillington, D.J., H.J. van Avendonk, **M.D. Behn**, and P.B. Kelemen, 2008, What can seismic velocity structure tell us about the composition of island arc lower crust? An example from the central Aleutians, *Eos. Trans. AGU*, 89(53), Fall Meet. Suppl., V22A-07.
- Behn, M.D.**, Implications of grain size evolution on the seismic structure of the oceanic upper mantle, AGU Chapman Conference, Mt. Shasta, CA, September 2008.
- †**Behn, M.D.**, G. Hirth, and P.B. Kelemen, 2007, Mechanisms for 3-D flow in the mantle wedge at subduction zones, *Eos. Trans. AGU*, 88(52), Fall Meet. Suppl., Abstract U14A-01.
- Conrad, C.P. **M.D. Behn**, and P.G. Silver, 2007, Seismic anisotropy as a constraint on global mantle flow and plate motions, *Eos. Trans. AGU*, 88(52), Fall Meet. Suppl., U34A-08.
- Hacker, B.R., P.B. Kelemen, and **M.D. Behn**, 2007, Continental relamination drives compositional and physical-property changes in the lower crust, *Eos. Trans. AGU*, 88(52), Fall Meet. Suppl., V32A-06.
- Montési, L.G., **M.D. Behn**, J.J. Standish, and H.J. Dick, 2007, Preservation of fertile mantle components at mid-ocean ridges, *Eos. Trans. AGU*, 88(52), Fall Meet. Suppl., U14A-05.
- \*Gregg, P.M., **M.D. Behn**, J. Lin, T.L. Grove, and L.G. Montési, 2007, The effect of fault segmentation on the dynamics of fast-slipping oceanic transform faults, *Eos. Trans. AGU*, 88(52), Fall Meet. Suppl., T22E-04.
- \*Roland, E.C., **M.D. Behn**, and G. Hirth, 2007, Thermal-mechanical behavior of oceanic transform faults—Implications for hydration of the upper oceanic mantle, *Eos. Trans. AGU*, 88(52), Fall Meet. Suppl., T32B-06.
- G. Ito and **M.D. Behn**, 2007, Tecto-magmatic cycles, faulting, and morphology of mid-ocean ridges, *Eos. Trans. AGU*, 88(52), Fall Meet. Suppl., T22E-07.
- Tucholke, B.E., **M.D. Behn**, J. Canales, M. Xu, W.R. Buck, and J. Lin, 2007, The crustal section exhumed by oceanic detachment faults, *Eos. Trans. AGU*, 88(52), Fall Meet. Suppl., T51F-05.
- Williams, C.M., M.A. Tivey, **M.D. Behn**, H.J. Dick, and B.E. Tucholke, 2007, Geometry of a polarity reversal boundary in lower crust and upper mantle at Kane megamullion, *Eos. Trans. AGU*, 88(52), Fall Meet. Suppl., T53B-1305.
- \*Krawczynski, M.J., **M.D. Behn**, S.B. Das, and I. Joughin, 2007, Constraints on melt-water flux through the west Greenland ice-sheet: modeling of hydro-fracture drainage of supraglacial lakes, *Eos. Trans. AGU*, 88(52), Fall Meet. Suppl., C53A-02.
- Das, S.B., I. Joughin, **M.D. Behn**, I. Howat, M.A. King, D. Lizarralde, M.P. Bhatia, 2007, Direct observations of melt-water lake drainage and the establishment of an efficient surface to basal water connection on the Greenland ice sheet, *Eos. Trans. AGU*, 88(52), Fall Meet. Suppl., C41B-0474.
- Behn, M.D.**, B.E. Tucholke, W.R. Buck, and J. Lin, 2007, The influence of magmatism on the evolution of oceanic core complexes, *GSA Penrose Conference on the Rifting of Continents*, Naxos, Greece.

- Behn, M.D.**, L. Montési, J.L. Barry, 2006, Effect of spreading rate and obliquity on mantle melting: Insights from scaling relations and numerical models, *Eos. Trans. AGU*, 87(52), Fall Meet. Suppl., V11G-03.
- \*Gregg, P.M., J. Lin, **M.D. Behn**, and L.G. Montési, 2006, Spreading rate dependence of the gravity structure of oceanic transform faults: Contrast between ultra-slow/slow and intermediate/fast slipping systems, *Eos. Trans. AGU*, 87(52), Fall Meet. Suppl., V23E-0698.
- Conrad, C.P., **M.D. Behn**, and P.G. Silver, 2006, Global mantle flow and the development of asthenospheric anisotropy: Differences between the oceanic and continental upper mantle, *Eos. Trans. AGU*, 87(52), Fall Meet. Suppl., T53C-1629.
- \*Elsenbeck, J.R., **M.D. Behn**, and G. Hirth, 2006, Influence of grain-size and water on the seismic structure of the oceanic upper mantle, *Eos. Trans. AGU*, 87(52), Fall Meet. Suppl., T13C-0518.
- Williams, C.M., M.A. Tivey, and **M.D. Behn**, 2006, The magnetic structure of the Kane Megamullion: Results from marine magnetic anomalies, paleomagnetic data and thermal modeling, *Eos. Trans. AGU*, 87(52), Fall Meet. Suppl., T24A-03.
- Silver, P.G. and **M.D. Behn**, 2006, Intermittent plate tectonics, *Eos. Trans. AGU*, 87(52), Fall Meet. Suppl., U13B-08.
- Tucholke, B.E., **M.D. Behn**, W.R. Buck, R. Qin and J. Lin, 2006, The role of melt supply in the formation of long-lived oceanic detachment faults, *Eos. Trans. AGU*, 87(52), Fall Meet. Suppl., V23E-0700.
- Qin, R., W.R. Buck, and **M.D. Behn**, 2006, Simulations of fault-dike interactions at mid-ocean ridges with applications to oceanic core complex development, *Eos. Trans. AGU*, 87(36), West. Pac. Geophys. Meet. Suppl., T42B-02.
- \*Gregg, P.M., J. Lin, **M.D. Behn**, and L.G. Montési, 2006, Spreading rate dependence of the gravity structure of oceanic transform faults, *Eos. Trans. AGU*, 87(36), West. Pac. Geophys. Meet. Suppl., T41B-05.
- Ito, G. and **M. Behn**, 2006, Magmatic intrusion and lithospheric dynamics at mid-ocean ridges, RIDGE 2000 Theoretical Institute, Mammoth Lakes, California.
- Silver, P.G. and **M.D. Behn**, 2006, Stopping plate tectonics, *When did plate tectonics begin on Earth?*, GSA Penrose Conference, Lander, Wyoming.
- Ito, G., **M. Behn**, and E. Mittelstaedt, 2006, Magmatic intrusion and lithospheric dynamics at mid-ocean ridges, 26<sup>th</sup> IUGG Conference on Mathematical Geophysics, Sea of Galilee, Israel.
- Silver, P.G., **M.D. Behn**, and C.P. Conrad, 2006, Characterizing the mantle flow field beneath North America using flow models constrained by seismic anisotropy, *Eos. Trans. AGU*, 87(36), Jt. Assem. Suppl., T31A-01.
- Behn, M.D.**, G. Hirth, and P.B. Kelemen, 2006, Lower crustal foundering as a mechanism for 3-D flow in the mantle wedge and trench-parallel seismic anisotropy, Keynote @ *Arc Genesis and Crustal Evolution*, GSA Penrose Conference, Valdez, Alaska, doi: 10.1130/2006.GAEOTJ.PFG.
- Behn, M.D.**, G. Hirth, and P.B. Kelemen, 2006, Lower crustal foundering as a mechanism for 3-D flow in the mantle wedge and trench parallel seismic anisotropy, MARGINS Workshop: Interpreting Upper Mantle Images, Woods Hole, Massachusetts.
- Montési, L.G.J., **M.D. Behn**, and J.L. Barry, 2006, Mantle flow and melting at oblique segments of the Southwest Indian Ridge, *Geophys. Res. Abstracts*, v. 8, 04319.



- Montési, L.G.J., **M.D. Behn**, G. Corti, and G.C. Collins, 2006, What controls graben spacing and morphology? *Geophys. Res. Abstracts*, v. 8, 00976.
- †**Behn, M.D.** and P.B. Kelemen, 2005, Stability of arc lower crust: Insights from the Talkeetna Arc section, Alaska, and the seismic structure of modern arcs, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., V44C-06.
- Behn, M.D.**, C.P. Conrad, and P.G. Silver, 2005, Interaction between downwelling flow and the laterally-varying thickness of the North American lithosphere inferred from seismic anisotropy, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., T21D-04.
- \*Barry, J.L., **M.D. Behn**, and L.G. Montési, 2005, Melting and mantle flow at oblique ultraslow-spreading ridges, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., T41E-1351.
- Brooks, B.A., J.J. Foster, M. Bevis, L.N. Frazer, and **M. Behn**, 2005, Slow earthquakes on the flank of Kilauea volcano, Hawai'i, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., G53B-0879.
- Buck, W.R., R. Qin, L.L. Lavie, and **M.D. Behn**, 2005, Numerical simulations of faulting and magmatism at ridges illustrates conditions for oceanic detachment faults, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., T34B-06.
- Kelemen, P., J. Amato, **M. Behn**, J. Blusztajn, N. Christensen, P. Clift, S. DeBari, A. Draut, A. Greene, B. Hacker, K. Hanghoj, S. Hart, G. Hirth, J. Mattinson, L. Mehl, T. Pavlis, M. Rioux, J. Trop, 2005, Crustal genesis and dynamics in the Jurassic Talkeetna Arc, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., V44C-05.
- Montési, L., **M.D. Behn**, and J. Barry, 2005, On the geodynamics of oblique spreading, *Eos Trans. AGU*, 86(52), Fall Meet. Suppl., T42A-06.
- Behn, M.D.**, and G. Ito, 2005, The effect of magmatism on faulting and axial morphology at mid-ocean ridges: Modeling the transition from rift valley to axial high, 9<sup>th</sup> International Workshop on Numerical Modeling of Mantle Convection and Lithospheric Dynamics, Erice, Sicily.
- Kujawinski, E. and **M. Behn**, 2005, Application of ESI FT-ICR MS to molecular-level characterization of NOM: A progress report on data analysis and interpretation, 230<sup>th</sup> ACS National Meeting, Washington, DC.
- Conrad, C.P., C. Lithgow-Bertelloni, **M.D. Behn**, 2005, Lateral variations in lithospheric viscosity: Implications for seismic anisotropy and lithospheric stresses, 2005 Boulder Mantle Convection Workshop, Boulder, CO, June 2005.
- Behn, M.D.**, C.P. Conrad, and P.G. Silver, 2005, Seismic anisotropy and mantle flow across Continental North America, Earthscope National Meeting, Santa Ana Pueblo, New Mexico.
- †**Behn, M.D.**, C.P. Conrad, and P.G. Silver, 2004, Seismic anisotropy and flow in the oceanic and continental upper mantle: Inferences from SKS splitting observations, *Eos Trans. AGU*, 85(47), Fall Meet. Suppl., T51B-05.
- Behn, M.D.**, W.R. Buck, I.S. Sacks and G. Ito, 2004, Influence of magma injection on faulting and topography at mid-ocean ridges, *Eos Trans. AGU*, 85(47), Fall Meet. Suppl., V23B-0629.
- Montési, L.G., **M.D. Behn**, and G. Corti, 2004, Predictions of fault spacing at the scale of the lithosphere from analytical, numerical, and analogue studies, *Eos Trans. AGU*, 85(47), Fall Meet. Suppl., T51A-0436.
- F. Niu, P.G. Silver, **M.D. Behn**, 2004, Measuring Anisotropy in the Oceanic Upper Mantle from Splitting in SS Waveforms, *Eos Trans. AGU*, 85(17), Jt. Assem. Suppl., S44A-03.

- Behn, M.D.**, W.R. Buck, and I.S. Sacks, 2004, Mechanical implications of dike injection at oceanic spreading centers, RIDGE 2000 Mid-Atlantic Ridge Workshop, Providence, RI.
- Behn, M.D.**, C.P. Conrad, and P.G. Silver, 2003, Evidence for upper mantle flow associated with the African superplume, *Eos Trans. AGU*, 84(46), Fall Meet. Suppl., T51B-05.
- Behn, M.D.**, C.P. Conrad, and P.G. Silver, 2003, The mantle flow field surrounding Africa: Constraints from shear-wave splitting measurements and mantle flow calculations, *Gordon Research Conference: Interior of the Earth*, Mt. Holyoke, Massachusetts.
- Cowie, P., A. Mcleod, **M. Behn**, J. Lin, and J. Underhill, 2003, A thermal explanation for the migration of fault activity during lithospheric extension, *Geophys. Res. Abstr.*, v. 5, EGS 28th General Assembly, 09610.
- Behn, M.D.** and P.B. Kelemen, 2002, What seismic measurements tell us about the composition of the lower crust, INVITED, *Eos Trans. AGU*, 83(47), Fall Meet. Suppl., T61A-1215.
- Behn, M.D.**, J.M. Sinton, and R.S. Detrick, 2002, Effect of the Galápagos Hotspot on Seamount Formation along the Galápagos Spreading Center, *Eos Trans. AGU*, 83(47), Fall Meet. Suppl., T72C-03.
- Behn, M.D.**, J. Lin, and M.T. Zuber, 2002, Effect of hydrothermal cooling and magma injection on axial morphology: Results from mechanical models, InterRidge Theoretical Institute: Thermal regime of ocean ridges and dynamics of hydrothermal circulation, Pavia, Italy, p. 27.
- Behn, M.D.**, J. Lin, and M.T. Zuber, 2001, A continuum approach to normal faulting using a strain-rate softening rheology: Implications for thermal and rheological controls on continental rifting, *Eos Trans. AGU*, 82(47), Fall Meet. Suppl., T1106.
- Sinton, J.M., R.S. Detrick, J.P. Canales, G. Ito, **M. Behn**, T. Blacic, B. Cushman, J. Dixon, 2001, Correlated geophysical, geochemical and volcanological manifestations of plume-ridge interaction along the Galápagos Spreading Center, 90.5°–98°W, *Eos Trans. AGU*, 82(47), Fall Meet. Suppl., T41D-02.
- Behn, M.D.**, J. Lin, and M.T. Zuber, 2001, Effects of a strain-rate softening crustal rheology on the development of normal faults at mid-ocean ridges, *Eos Trans. AGU*, 82(20), Spring Meet. Suppl., S410.
- Behn, M.D.** and J. Lin, 2001, Segmentation in gravity and magnetic anomalies along the U.S. East Coast passive margin and its implications on incipient margin structure, *Geophys. Res. Abs.*, v.3, EGS 26th General Assembly, 678.
- Behn, M.D.**, J. Lin, and M.T. Zuber, 2000, Rheologic controls on the modes of faulting at a mid-ocean ridge spreading segment, *Eos Trans. AGU*, 81(48), Fall Meet. Suppl., F1079.
- Behn, M.D.**, J. Lin, and M.T. Zuber, 2000, Spatial variations in oceanic plate rheology and their effects on lithosphere dynamics of mid-ocean ridge spreading segments, *Eos Trans. AGU*, 81(19), Spring Meet. Suppl., S410.
- Behn, M.D.** and J. Lin, 1998, Evidence for segmentation along the U.S. East Coast margin, *Eos Trans. AGU*, 79(45), Fall Meet. Suppl., F860.
- Behn, M.D.** and J. Lin, 1998, Variations in geophysical anomalies along the US East Coast margin, *Eos Trans. AGU*, 79(17), Spring Meet. Suppl., S337.
- Behn, M.D.** and J.D. Eusden, Jr., 1998, A geophysical overview of the Sebago Pluton, Maine: *Geol. Soc. of Amer.*, Abstracts with Programs, 30, 4.

**Behn, M.D.** and M.T. Zuber, 1997, Comparison of ocean topography derived from the Shuttle Laser Altimeter -01 with TOPEX/POSEIDON, *Eos Trans. AGU*, 78(46), Fall Meet. Suppl., F375.

**Behn, M.D.**, J.D. Eusden, Jr., and J.A. Notte III, 1996, Gravity study of the southern contact of the Sebago Pluton, Maine: *Geol. Soc. of Amer.*, Abstracts with Programs, 28, 39.