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March 28, 2024

EDUCATION

1997 – 2002	Harvard University, *Ph. D. in Geophysics*	Cambridge, MA
1992 – 1997	Goethe University, *Diplom in Physics*	Frankfurt am Main

PROFESSIONAL APPOINTMENTS

2016 –	*Shell Foundation Distinguished Chair in Geophysics*	
	Jackson School of Geosciences, UT Austin	Austin, TX
2021 –	*Faculty Affiliate*, Oden Institute for Computational	
	Engineering and Sciences, UT Austin	Austin, TX
2004 – 2016	*Assistant* (–2009), *Associate* (–2012), *Professor of Earth Sciences*	
	University of Southern California	Los Angeles, CA
2002 – 2004	*Cecil H. and Ida M. Green Postdoctoral Scholar*	
	Scripps Institution of Oceanography, U.C. San Diego	La Jolla, CA

VISITING APPOINTMENTS

Summer 2012	Universitá di Roma TRE, *Visiting Professor*	Rome
Fall 2010	University of Tokyo, *Visiting Associate Professor*	Tokyo
Spring 2008	Princeton University, *Visiting Fellow*	Princeton, NJ

ACADEMIC HONORS

- *Augustus Love Medal*, European Geoscience Union, 2023.
- Member, *Academia Europaea*, 2021.
- *Evgueni Burov Medal*, ILP, International Union of Geodesy and Geophysics, 2021.
- Fellow, *American Geophysical Union*, 2015.
- *Astor Visiting Fellowship*, Oxford University, 2014.
- *Friedrich Wilhelm Bessel Research Award*, Humboldt Foundation, 2013.
- *C. F. Gauss lecturer*, German Geophysical Society, 2008.
- *Frontiers of Science Fellow*, Kavli Foundation, 2007.
- *Editor's Citation for Excellence in Refereeing* for *Tectonics*, 2007.
- *CAREER Award*, National Science Foundation, 2007.
- *Cecil H. and Ida M. Green Scholarship*, SIO, UC San Diego, 2002 – 2004.
- *Certificate of Excellence in Teaching*, Derek Bok Center, Harvard University, 2001.
- Ph. D. Scholarship, *German Academic Exchange Service* (DAAD), 1998 – 2001.
- *Siedler Prize* for the best M.Sc. thesis in Physics at Frankfurt University, 1997.
- *Haereus Prize* for Physics M.Sc. students in the state of Hesse, 1997.

RESEARCH EXPERIENCE

My main research interests are in geodynamics and seismology with focus on how planets' interior and surface systems have co-evolved. Our team integrates field, laboratory, and numerical approaches into geodynamic and structural models, focusing on the physics of plate tectonics, from grain-scale deformation to earthquakes and global mantle convection. Our work was recognized by a *Humboldt Foundation Bessel Award*, the IUGG *Evgueni Burov Medal*, the EGU *Augustus Love Medal*, and a Fellowship of the American Geophysical Union.

My teaching interests include Tectonic Geodynamics, Natural Hazards, Geophysics, Deep Earth Dynamics, and Numerical Modeling of Earth Systems. I currently chair the *Standing Committee on Solid Earth Geophysics*, and am a member of the *Board of Earth Sciences and Resources*, both at the US National Academies. Other service includes a near decade stint as Editor in Chief of *Geochemistry, Geophysics, Geosystems*, and current editorial work for *AGU Advances*. I also served on the Planning Committee of the *Southern California Earthquake Center* and currently lead the *Megathrust Modeling Framework* NSF-FRES project.

PEER-REVIEWED ARTICLES AND REFEREED CONFERENCE CONTRIBUTIONS

°: undergraduate, ⋆: graduate student, ×: post-doctoral scholar (co-)supervised

155 Straume, E. O.×, Steinberger, B., **Becker, T. W.**, and Faccenna, C. (2024): Impact of mantle convection and dynamic topography on the Cenozoic paleogeography of Central Eurasia and the West Siberian Seaway. *Earth Planet. Sci. Lett., 630*, 118615.

154 **Becker, T. W.** and Fuchs, L.× (2023): Generation of evolving plate boundaries and toroidal flow from visco-plastic damage-rheology mantle convection and continents. *G-Cubed, 24*, e2023GC011179, doi:10.1029/2023GC011179. (27 p.)

153 Puel, S.⋆, **Becker, T. W.**, Villa, U., Ghattas, O., and Liu, D. (2023): An adjoint-based optimization method for jointly inverting heterogeneous material properties and fault slip from earthquake surface deformation data. *Geophys. J. Int.*, doi:10.1093/gji/ggad442. (20 p.)

152 Conrad. E. M.⋆, Reitano, R., Faccenna, C., **Becker, T. W.** (2023): Morpho-tectonics of transpressional systems: insights from analog modeling. *Tectonics, 23*, doi:10.1029/2023TC007865. (25 p.)

151 Clennett, E. J.⋆, Holt, A. F., Tetley, M. G., **Becker, T. W.**, and Faccenna, C. (2023): Assessing plate reconstruction models using plate driving force consistency tests. *Sci. Rep., 19*, 10191. (15 p.)

150 Lanari, R., Faccenna, C., Natali, C., Şengül Uluocak, E., Fellin, M. G., **Becker, T.W.**, Göğüş, O., Youbi, N., Clementucci, R., and Conticelli, S. (2023): The Atlas of Morocco: A plume-assisted orogeny. *G-Cubed, 24*, doi:10.1029/2022GC010843. (28 p.)

149 Paul, J.×, Conrad, C. P., **Becker, T. W.**, and Ghosh, A. (2023): Convective self-compression of cratons and the stabilization of old lithosphere. *Geophys. Res. Lett., 50*, doi:10.1029/2022GL101842. (10 p.)

148 Hua, J.×, Fischer, K., **Becker, T.W.**, Gazel, E. and Hirth, G. (2023): Asthenospheric low-velocity zone consistent with globally prevalent partial melting. *Nature Geosc., 16*, 175-181.

147 Fuchs, L.$^{\times}$ and **Becker, T.W.** (2022): On the role of rheological memory for convection-driven plate reorganizations. *Geophys. Res. Lett., 49*, e2022GL099574. (11 p.)

146 Heilman, E.* and **Becker, T. W.** (2022): Plume-slab interactions can shut off subduction. *Geophys. Res. Lett., 49*, e2022GL099286. (9 p.)

145 Behr, W. M., Holt, A. F., **Becker, T. W.**, and Faccenna, C. (2022): The effects of plate interface rheology on subduction kinematics and dynamics. *Geophys. J. Int., 230*, 796–812.

144 Puel, S.*, Khattatov, E., Villa U., Liu, D., Ghattas, O. and **Becker, T. W.** (2022): A Mixed, unified forward/inverse framework for earthquake problems: Fault implementation and coseismic slip estimate. *Geophys. J. Int., 230*, 733–758.

143 Gerya, T. V., Bercovici, D., and **Becker, T. W.** (2021): Dynamic slab segmentation due to brittle-ductile damage in the outer rise. *Nature, 599*, 245–250.

142 Schulte-Pelkum, V., **Becker, T. W.**, Behr, W. M., and Miller, M. S. (2021): Tectonic inheritance during plate boundary evolution in southern California constrained from seismic anisotropy. *Geochem., Geophys., Geosys., 22*, doi:10.1029/2021GC010099. (22 p.)

141 Brizzi, S.$^{\times}$, **Becker, T. W.**, Faccenna, C., Behr, W. M., van Zelst, I., Dal Zilio, L. and van Dinther, Y. (2021): The role of sediment accretion and buoyancy on subduction dynamics and geometry. *Geophys. Res. Lett., 48*, doi:10.1029/2021GL096266. (12 p.)

140 Porritt, R.$^{\times}$, **Becker, T.W.**, Boschi, L., and Auer, L. (2021): Multi-scale, radially anisotropic shear wave imaging of the mantle underneath the contiguous United States through joint inversion of USArray and global datasets. *Geophys. J. Int., 265*, 1730–1746.

139 Koppers, A., **Becker, T.W.**, Jackson, M., Konrad, K., Müller, R.D., Romanowicz, B., Steinberger, B., and Whittaker, J. (2021): Mantle plumes and their role in Earth processes. *Nature Rev. Earth & Environ., 2*, 382–401.

138 Faccenna, F., **Becker, T. W.**, Holt, A. F., and Brun, J. P. (2021): Mountain building, mantle convection, and supercontinents: Holmes (1931) revisited. *Earth Planet. Sci. Lett., 564*, Frontiers, 116905. (17 p.)

137 Jackson, M. G., **Becker, T. W.**, and Steinberger, B. (2021): Spatial characteristics of recycled and primordial reservoirs in the deep mantle. *Geochem., Geophys., Geosys., 22*, doi:10.1029/2020GC009525. (26 p.)

136 Miller, M. S., Zhang, P., Dahlquist, M. P.*, West, A. J., **Becker, T. W.**, and Harris, C. W.* (2021): Inherited lithospheric structures control arc-continent collisional heterogeneity. *Geology, 49*, 652–656.

135 Fuchs, L.$^{\times}$ and **Becker, T. W.** (2020): Deformation memory in the lithosphere: A comparison of damage-dependent weakening and grain-size sensitive rheologies. *J. Geophys. Res., 126*, doi:10.1029/2020JB020335. (22 p.)

134 Jackson, M. G., Blichert-Toft, J., Halldórsson, S. A., Mundl-Petermeier, A., Bizimis, M., Kurz, M. D., Price, A. A., Harðardóttir, S., Willhite, L. N., Breddam, K., **Becker T. W.**, and Fischer, R. A. (2020): Ancient helium and tungsten isotopic signatures preserved in mantle domains least modified by crustal recycling. *Proceed. Nat. Acad. Sci., 117*, 30,993–31,001.

133 Lau, N.*, Borsa, A. A. and **Becker, T. W.** (2020): Present-day crustal vertical velocity field for the Contiguous United States. *J. Geophys. Res., 125*, doi:10.1029/2020JB020066. (16 p.)

132 Faccenna, C. and **Becker, T. W.** (2020): Topographic expressions of mantle dynamics in the Mediterranean. *Earth-Sci. Rev., 209*, doi:10.1016/j.earscirev.2020.103327. (19 p.)

131 Schulte-Pelkum, V., Cain, J. S, Jones II, J. V., and **Becker, T. W.** (2020): Imaging the tectonic grain of the Northern Cordillera orogen using Transportable Array receiver functions. *Seismol. Res. Lett., 91*, 3086–3105.

130 Pritchard, M. E., R. M. Allen, **T. W. Becker**, M. D. Behn, E. E. Brodsky, R. Bürgmann, C. Ebinger, J. T. Freymueller, M. Gerstenberger, B. Haines, Y. Kaneko, S. D. Jacobsen, N. Lindsey, J. J. McGuire, M. Page, S. Ruiz, M. Tolstoy, L. Wallace, W. R. Walter, W. Wilcock, and H. Vincent (2020): New opportunities to study earthquake precursors. *Seismol. Res. Lett., 91*, 2444–2447.

129 **Becker, T. W.** and Lebedev, S. (2020): Dynamics of the upper mantle in light of seismic anisotropy. In *Mantle Convection and Surface Expressions*, Cottaar, S. et al., eds., AGU, Washington DC, doi:10.1002/9781119528609.ch10. https://bit.ly/2ZkTgji

128 Ichimura, T., Fujita, K., Yamaguchi, T., Naruse, A., Wells, J. C., Zimmer, C. J., Straatsma, T.P., Hori, T., Puel, S.*, **Becker, T.W.**, and Hori, M. (2019). 416-PFLOPS fast scalable implicit solver on low-ordered unstructured finite elements accelerated by 1.10-ExaFLOPS kernel with reformulated AI-like algorithm: For equation-based earthquake modeling. In *Research Poster for SC19: International Conference for High Performance Computing, Networking, Storage and Analysis*, doi:10.5281/zenodo.3984156, Denver CO.

127 Faccenna, C., Glisovic, P., Forte, A., **Becker, T. W.**, Garzanti, E., Sembroni, A. and Gvirtzman, C. (2019): Role of dynamic topography in sustaining the Nile River over 30 million years. *Nat. Geosc., 12*, 1012–1017.

126 Bernard, R., Behr, W. M., **Becker, T. W.**, and Young, D. (2019): Relationships between olivine CPO and deformation parameters in naturally deformed rocks and implications for mantle seismic anisotropy. *Geochem., Geophys., Geosys., 20*, 1–27.

125 Fuchs, L.$^\times$ and **Becker, T. W.** (2019): Role of strain-dependent weakening memory on the style of mantle convection and plate boundary stability, *Geophys. J. Int., 218*, 601–618.

124 Lai, H., Garnero, E. J., Grand, S. P., Porritt, R. W.$^\times$, and **Becker, T. W.** (2019): Global travel time dataset from adaptive empirical wavelet construction. *Geochem., Geophys., Geosys., 20*, doi:10.1029/2018GC007905. (24 p.)

123 Wang, W.* and **Becker, T. W.** (2019): Upper mantle seismic anisotropy as a constraint for mantle flow and continental dynamics of the North American Plate. *Earth Planet. Sci. Lett., 514*, 143–155.

122 Weller, M. B.$^\times$, Fuchs, L.$^\times$, **Becker, T. W.**, and Soderlund, K. M. (2019): Convection in thin shells of icy satellites: Effects of latitudinal surface temperature variations. *J. Geophys. Res. – Planets*, doi:10.1029/2018JE005799. (25 p.)

121 Siravo, G., Faccenna, C., Gerault, M.$^\times$, **Becker, T. W.**, Fellin, M. G., Herman, F. and Molin, P. (2019): Slab flattening and the rise of the Eastern Cordillera, Colombia. *Earth Planet. Sci. Lett., 512*, 100–110.

120 Sternai, P., Sue, C., Husson, L., Serpelloni, E., **Becker, T. W.**, Willett, S., Faccenna, C., Di Giulio, A., Spada, G., Jolivet, L., Valla, P., Petit, C., Nocquet, J.-M., Walpersdorf, A., and Castelltort, S. (2019): Present-day uplift of the European Alps: evaluating mechanisms and models of their relative contributions. *Earth-Sci. Rev., 190*, 589–604.

119 **Becker, T. W.**, Hashima, A.$^{\times}$, Freed, A. M., and Sato, H. (2018): Stress change before and after the 2011 M9 Tohoku-oki earthquake. *Earth Planet Sci. Lett., 504*, 174–184.

118 Behr, W. M. and **Becker, T. W.** (2018): Sediment control on subduction plate speeds. *Earth Planet. Sci. Lett., 502*, 166–173.

117 Jackson, M.G., **Becker, T. W.**, and Konter, J. G. (2018): Geochemistry and distribution of recycled domains in the mantle inferred from Nd and Pb isotopes in oceanic hotspots: implications for storage in the large low shear wave velocity provinces (LLSVPs). *G-Cubed, 19*, 3496–3519, 2018.

116 Jolivet, L., Faccenna, C., **Becker, T. W.**, Tesauro, M., Sternai, P., and Bouihol, P. (2018): Mantle flow and deforming continents: From India-Asia convergence to Pacific subduction. *Tectonics, 37*, 2887–2914.

115 Holt, A. F.$^{\times}$, Royden, L. H., **Becker, T. W.**, and Faccenna, F. (2018): Slab interactions in 3-D subduction settings: The Philippine Sea Plate region. *Earth Planet. Sci. Lett., 489*, 72–83.

114 Jackson, M. G., **Becker, T. W.**, and Konter, J. G. (2018): Evidence for a deep mantle source for EM and HIMU domains from integrated geochemical and geophysical constraints. *Earth Planet. Sci. Lett., 484*, 154–167.

113 Faccenna, C., Holt, A. F.$^{\times}$, **Becker, T. W.**, Lallemand, S., and Royden, L. H. (2018): Dynamics of the Ryukyu/Izu-Bonin-Marianas double subduction system. *Tectonophys., 746*, 229–238.

112 Wagner, L., Jaramillo, J. S., Ramírez-Hoyos, L. F., Monsalve, G., Cardona, A. and **Becker, T. W.** (2017): Transient slab flattening beneath Colombia. *Geophys. Res. Lett., 44*, 6616–6623.

111 Goebel, T. H. W., Kwiatek, G., **Becker, T. W.**, Brodsky, E. E. and Dresen, G. (2017): What allows seismic events to grow big?: Insights from *b*-value and fault roughness analysis in laboratory stick-slip experiments. *Geology, 44*, 815–818.

110 **Becker, T. W.** (2017): Superweak asthenosphere in light of upper-mantle seismic anisotropy, *Geochem., Geophys., Geosys., 18*, 1986–2003.

109 Sembroni, A., Kiraly, A., Faccenna, C., Funiciello, F., **Becker, T. W.**, Globig, J., and Fernandez, M. (2017): Impact of the lithosphere on dynamic topography: Insights from analogue modeling. *Geophys. Res. Lett., 44*, 2693—2702.

108 Jackson, M. G., Konter, J. G., and **Becker, T. W.** (2017): Primordial helium entrained by the hottest mantle plumes. *Nature, 542*, 340–343.

107 Holt, A. F.*, Royden, L. H., and **Becker, T. W.** (2017): The dynamics of double slab subduction. *Geophys. J. Int., 209*, 250–265.

106 Faccenna, C., Oncken, O., Holt, A. F.*, and **Becker, T. W.** (2017): Initiation of the Andean orogeny by lower mantle subduction. *Earth Planet. Sci. Lett., 463*, 189–201.

105 Holt, A. F.* and **Becker, T. W.** (2017): The effect of a power-law mantle viscosity on trench retreat rate. *Geophys. J. Int., 208*, 491–507.

104 Freed, A. M., Hashima, A.$^{\times}$, **Becker, T. W.**, Okaya, D. A., Sato, H., and Hatanaka. Y. (2017): Resolving depth-dependent subduction zone viscosity and afterslip from postseismic displacements following the 2011 Tohoku-oki, Japan earthquake. *Earth Planet. Sci. Lett., 459*, 279–290.

103 Hashima, A.$^{\times}$, **Becker, T. W.**, Freed, A. M., Sato, H., and Okaya, D. A. (2016): Coseismic deformation due to the 2011 Tohoku-oki earthquake: influence of 3-D elastic structure around Japan. *Earth, Planet., Space, 68*, 159, doi:10.1186/s40623-016-0535-9. (15 p.)

102 Schaeffer, A., Lebedev, S., and **Becker, T. W.** (2016): Azimuthal seismic anisotropy in the Earth's upper mantle and the thickness of tectonic plates. *Geophys. J. Int., 207*, 901–933.

101 Steinberger, B. and **Becker, T. W.** (2016): A comparison of lithospheric thickness models. *Tectonophys.*, doi:10.1016/j.tecto.2016.08.001. (14 p.)

100 Miller, M. S., O'Driscoll, L. J.$^{\times}$, Roosmawati, N., Harris, C. W.*, Porritt, R. W.$^{\times}$, Widiyantoro, S., de Costa, L. T., Soares, E., **Becker, T. W.**, and West A. J. (2016): Banda Arc Experiment - Transitions in the Banda Arc-Australian continental collision. *Seismol. Res. Lett., 87*, doi:10.1785/0220160124. (7 p.)

99 Gvirtzman, Z., Faccenna, C., and **Becker, T. W.** (2016): Isostasy, flexure, and dynamic topography. *Tectonophys., 683*, 255–271.

98 Sternai, P., Avouac, J.-P., Jolivet, L., Faccenna, C., Gerya, T., **Becker, T. W.**, and Menant, A. (2016): On the influence of the asthenospheric flow on the tectonics and topography at a collision-subduction transition zones: Comparison with the eastern Tibetan margin. *J. Geodyn., 100*, 184–197.

97 Sembroni, A., Faccenna, C., **Becker, T. W.** , Molin, P., and Bekele, A. (2016): Long-term, deep mantle support of the Ethiopian swell. *Tectonics, 35*, 469–488.

96 Auer, L., **Becker, T. W.**, Boschi, L., and Schmerr, N. (2015): Thermal structure, radial anisotropy, and dynamics of oceanic boundary layers. *Geophys. Res. Lett., 42*, 9740–9749.

95 Uhl, J. T., Pathak, S., Schorlemmer, D., Liu, X., Swindeman, R., Brinkman, B. A. W., LeBlanc, M., Tsekenis, G., Friedman, N., R. Behringer, Denisov, D., Schall, P., Gu, X., Wright, W. J., Hufnagel, T., Jennings, A., Greer, J. R., Liaw, P. K., **Becker, T. W.**, Dresen, G., and Dahmen, K. A. (2015): Universal quake statistics: From compressed nanocrystals to earthquakes. *Sci. Rep., 5*, 16493. (10 p.)

94 **Becker, T. W.**, Lowry, A. R., Faccenna, C., Schmandt, B., Borsa, A., and Yu, C. (2015): Western U.S. intermountain seismicity caused by changes in upper mantle flow. *Nature, 524*, 458–461.

93 Corsetti, F. A., K. A. Ritterbush, D. J. Bottjer, S. E. Greene, Y. Ibarra, J. A. Yager, A. J. West, W. M. Berelson, S. Rosas, **T. W. Becker**, N. M. Levine, S. J. Loyd, R. C. Martindale, V. A. Petryshyn, N. R. Carroll, E. Petsios, O. Piazza, C. Pietsch, J. L. Stellmann*, J. R. Thompson, K. A. Washington, and D. T. Wilmeth (2015): Investigating the paleoecological consequences of supercontinent breakup: Sponges clean up in the Early Jurassic. *Sediment. Rec., 13*, 4–10.

92 Holt, A. F.*, Buffett, B. A., and **Becker, T. W.** (2015): Overriding plate thickness control on subducting plate curvature. *Geophys. Res. Lett., 42*, 3802–3810.

91 **Becker, T. W.**, Schaeffer, A. J., Lebedev, S., and Conrad, C. P. (2015): Toward a generalized plate motion reference frame. *Geophys. Res. Lett., 42*, 3188–3196.

90 Jagoutz, O., Royden, L., Holt, A. F.*, and **Becker, T. W.** (2015): Anomalously fast convergence between India and Eurasia caused by double subduction. *Nat. Geosc., 8*, 475–478.

89 Holt, A. F.*, **Becker, T. W.**, and Buffett, B. A. (2015): Trench migration and overriding plate stress in dynamic subduction models. *Geophys. J. Int., 201*, 172–192.

88 Porritt, R. W.$^{\times}$, **Becker, T. W.**, and Monsalve, G. (2014): Seismic anisotropy and slab dynamics from SKS splitting recorded in Colombia. *Geophys. Res. Lett., 41*, 8775–8783.

87 Sun, D.$^{\times}$, Miller, M. S., Holt, A. F.*, and **Becker, T. W.** (2014): Hot upwelling conduit beneath the Atlas Mountains, Morocco. *Geophys. Res. Lett.*, *41*, 8037–8044.

86 Yarce, Y., Monsalve, G., **Becker, T. W.**, Cardona, A., Poveda, E., Alvira, D., Ordoñez-Carmona, O. (2014): Seismological observations in Northwestern South America: Evidence for two subduction segments, contrasting crustal thicknesses and upper mantle flow. *Tectonophys., 637*, 57–67.

85 Faccenna, C., **Becker, T. W.**, Miller, M. S., Serpelloni, E., and Willett, S. D. (2014): Isostasy, dynamic topography, and the elevation of the Apennines of Italy. *Earth Planet. Sci. Lett., 407*, 163–174.

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80 Goebel, T. H. W.*, **Becker, T. W.**, Sammis, C. G., Dresen. G., and Schorlemmer, D. (2014): Off-fault damage and acoustic emission distributions during the evolution of structurally-complex faults over series of stick-slip events. *Geophys. J. Int., 197*, 1705–1718.

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78 **Becker, T. W.**, Faccenna, C., Humphreys, E. D., Lowry, A. R., and Miller, M. S. (2014): Static and dynamic support of western U.S. topography. *Earth Planet. Sci. Lett., 402*, 234–246.

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75 Goebel, T. H. W.*, Sammis, C. G., **Becker, T. W.**, Dresen, G., and Schorlemmer, D. (2013): A comparison of seismicity characteristics and fault structure between stick-slip experiments and nature. *Pure Appl. Geophys.*, doi:10.1007/s00024-013-0713-7. (18 p.)

74 Yamato, P., Husson, L., **Becker, T. W.**, and Pedoja, K. (2013): Passive margins getting squeezed in the mantle convection vice. *Tectonics, 32*, 1599–1570.

73 Alpert, L. A.*, Miller, M. S., **Becker, T. W.**, and Allam, A. A. (2013): Structure beneath the Alboran from geodynamic flow models and seismic anisotropy. *J. Geophys. Res., 118*, 4265–4277.

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Invited Presentations and Keynotes During the Last Three Years

- JAMSTEC, Yokohama, Japan, January 2024.
- Njord Seminar, University of Oslo, Norway, November 2023.
- Pontificia Universidad Católica de Chile, Santiago, Chile, August 2023.
- GeoForschungsZentrum, Potsdam, Germany, July 2023.
- *CSDMS2023: Patterns and Processes Across Scales* meeting, Boulder, May 2023 (recording).
- IGPP, Scripps Institution of Oceanography, UC San Diego, May 2023.
- *Augustus Love Medal* lecture, EGU Meeting, Vienna, Austria, April 2023 (recording).
- Workshop on *Earth's History, Dynamics and Planetary Habitability*, Sundvollen, Norway, November 2022.
- Earthquake Research Institute, The University of Tokyo, November 2022.
- 15^{th} World Congress on Computational Mechanics, Yokohama, July 2022.
- Seismic Tomography Workshop, Oxford UK, June 2022.
- Ocean University of China, Qingdao, April 2022.
- 167 invited presentations and keynotes between 1998 and 2021.

Conference Contributions

- 24 in 2023 and 19 in 2022.
- 520 contributions between 1996 and 2021.

Professional Affiliations

- American Geophysical Union, Fellow
- Academia Europaea, Member
- Deutsche Geophysikalische Gesellschaft, Member

Selected Synergistic Activities

- Scientific Editing:
  - Editor. *AGU Advances*, 2020 – 2025.
  - Editor. *Geochemistry, Geophysics, Geosystems (G^3)*, 2009 – 2020.
  - Editor in Chief. *Geochemistry, Geophysics, Geosystems (G^3)*, 2009 – 2017.
  - Advisor. *Earth and Space Science Open Archive*, 2018 – 2019.
  - Editor. *Geophysical Journal International*, 2004 – 2009.
- National Research Council, National Academy of Sciences
  - Chair, *Standing Committee on Solid Earth Geophysics*, 2019 – 2024.
  - Member, *Board on Earth Sciences and Resources*, 2019 – 2024.
  - Member, *Standing Committee on Solid Earth Geophysics*, 2015 – 2024.
- Member, Scientific Advisory Council, *GeoForschungsZentrum Potsdam*, 2023 –.

- Member, Review Committee, *Earthquake Research Institute*, University of Tokyo, 2022.
- Proposal Evaluation Committees:
  - German Science Foundation (DFG), 2017.
  - National Science Foundation, 2005, 2010 – 2012.
  - USGS, *National Earthquake Hazards Reduction Program*, 2005 – 2007.
- Southern California Earthquake Center.
  - Member, Planning Committee, 2009 – 2015.
  - Working group (co-)leader:
    - *Stress and Deformation Over Time*, 2012 – 2015.
    - *Lithospheric Architecture and Dynamics*, 2009 – 2011.
  - Member, Board, as representative for UT Austin, 2022 –.
- *Modeling Collaboratory for Subduction* and *SZ4D*
  - Member, Operational Planning Committee, *SZ4D*, 2022 – 2024.
  - Member, MCS Integrative Group, *SZ4D*, 2022 – 2024.
  - Principal Investigator, *Modeling Collaboratory for Subduction (MCS) Research Collaboration Network (RCN)*, 2018 – 2024.
  - Member, Steering Committee, *SZ4D RCN*, 2020 – 2021.
- Workshops and conference organization and network coordination:
  - Reports and community white papers:
    - Member, Writing Committee, *SZ4D Implementation Plan*, 2020 – 2022.
    - Member, Report Writing Committee, *Modeling Collaboratory for Subduction RCN Megathrust Modeling Workshop Report*, 2019 – 2020.
    - Member, Report Writing Committee, *Modeling Earthquake Source Processes: from Tectonics to Dynamic Rupture*, 2018 – 2019.
    - Member, Report Writing Committee, *Coupling of Tectonic and Surface Processes*, Boulder CO, 2018.
    - Member, Report Writing Committee, *The Subduction Zone Observatory Workshop*, 2016 – 2017.
    - Report Reviewer, *Challenges and Opportunities for Research in Earth Surface and Interior*, NASA, 2016.
  - Conference organization:
    - Co-organizer, *First Joint International Earthquake Science Symposium*, Austin TX, February 2024.
    - Chair, *Artificial Intelligence and Machine Learning in Geophysics – Are We Beyond the Black Box?* Committee on Solid Earth Geophysics, National Academy of Sciences, November 2023 (recording).
    - Megathrust Modeling Framework (MTMOD) Allhands Meetings: Austin TX, 2021, 2022; co-organizer: San Diego CA, 2023.
    - Organizer, MCS-SZ4D *Computational Solid Earth Science Initiative Coordination Meeting*, Boulder CO, June 2022.
    - Discussion leader, *SZ4D* SIG, SAGE/GAGE Meeting, August 2021.
    - Discussion leader, *Rift2Ridge* Meeting, June 2021.
    - Co-chair, *Solid Earth Science and Sea Level Change*. Committee on Solid Earth Geophysics, National Academy of Sciences, Washington DC, November 2020.(recording)

- Member, Advisory Committee, *Computational Engineering and Science for Safety and Environmental Problems* (COMPSAFE), 2018 – 2020.
- Co-Chair, *The PLATES Symposium: 30 Years of PLATES*, Jackson School of Geosciences, Austin TX, April 2019.
- Co-Chair and Organizing Committee, Workshop on *Coupling of Tectonic and Surface Processes*, Boulder CO, April 2018.
- Co-chair, *Collaborative Graduate Training Initiatives in High-Performance Computing for the Solid Earth Sciences*. Committee on Seismology and Geodynamics, National Academy of Sciences, Washington DC, April 2016.
- Co-chair, *Southern California Earthquake Center* (SCEC) workshops:
  - *Community Stress Model*: Pomona, January 2019; Palm Springs CA, September 2015; Pomona CA, October 2014; Menlo Park CA, May 2013; Los Angeles CA, October 2012; Palm Springs CA, September 2011.
  - *Community Rheology Model*, Palm Springs CA, September 2015.
- Chair, CIDER *Dynamic Topography Working Group Meeting*, Boulder CO, April 2015.
- Program Committee Member, *Structure and Dynamics of the Oceanic Lithosphere/Asthenosphere System*, Miyagi, Japan, March 2015.
- Chair, *From Mantle to Crust: Continental Formation and Destruction*, CIDER summer school program, Berkeley CA, 2013.
- Chair and Organizer, *1st Southern California Deep Earth Dynamics Symposium*, Los Angeles CA, 2013.
- Program committee, *Chinese-American Kavli Frontiers of Science Symposium*, National Academy of Sciences, 2007 – 2009.
- Chair, *12th Annual Chinese-American Kavli Frontiers of Science Symposium*, National Academy of Sciences, Kunming, China, September 2009.
- Co-chair, *Advancing Numerical Modeling of Mantle Convection and Lithospheric Dynamics*, Davis CA, July 2008.
- Program Committee for Tectonophysics, American Geophysical Union Fall Meeting, 2004 – 2005.
- Chair, *Numerical Modeling of Mantle Convection and Lithospheric Dynamics*, Erice, Italy, September 2005.
- Chair, *MYRES-I: Heat, Helium, Hotspots, and Whole Mantle Convection*, San Diego CA, August 2004.

– Convener and organizer for webinars, workshops, and special sessions:
- *American Geophysical Union Fall Meeting*, December 2023.
- *Earthquake Physics and Applications of Machine Learning to Tectonic Faulting*, Rome, Italy, 2023.
- *11$^{\text{th}}$ ACES (APEC Cooperation for Earthquake Science) International Workshop*, Blenheim, New Zealand, February 2023.
- *MCS-RCN-CIG-CSDMS Computational Geoscience Webinar Series*, January 2021.
- *American Geophysical Union Fall Meeting*, virtual, December 2020.
- *Tracking Environmental Changes Due to COVID-19 Through Remote Sensing*, COSEG, NAS, Washington DC, July 2020.
- *American Geophysical Union Fall Meeting*, San Francisco CA, 2019.
- *Machine Learning in the Geosciences: Beyond the Black Box*, Workshop at COSG NAS, Washington DC, 2019.
- *MCS RCN Megathrust Modeling Workshop*, Eugene OR, 2019.
- *Ada Lovelace Workshop on Modelling Mantle and Lithosphere Dynamics*, Siena, Italy, 2019.

- 30 special sessions convened before 2019.

◦ Conference student presentation awards service:
  – Outstanding student poster award (OSPA) judge: AGU 2008, 2012, 2014. EGU 2014.
  – Mentor, AGU OSPA Union eLightning Presentation participants, 2017.

◦ Nominating and Award Committees:
  – European Union of Geosciences, Augustus Love Medal Committee, 2023 – 2026.
  – Computational Infrastructure for Geodynamics, 2012.
  – Tectonophysics Section, American Geophysical Union, 2009 – 2010, 2014 – 2017.

◦ Summer school teaching and organization and short courses:
  – Organizer and Convenor, *Megathrust Modeling Framework (MTMOD) Summer School on The Japanese Earthquake System*, Austin TX, August 2023.
  – Organizer and Instructor, *Megathrust Modeling Framework (MTMOD) Summer School on Time-Dependent Seismic Hazard*, Austin TX, August 2022.
  – Instructor, *Internal Earth* Doctoral Training, Barcelonette, France, October 2019.
  – Steering Committee, SCEC-ERI Tokyo *Summer School on Earthquake Science*, 2013 – 2015.
  – Advisory Committee, *Cooperative Institute for Dynamic Earth Research*, 2013 – 2017.
  – CIDER summer school participation:
    - *Subduction Dynamics*, Berkeley CA, 2017 (instructor),
    - *Flow in the Deep Earth*, Santa Barbara CA, 2016 (instructor),
    - *From Mantle to Crust: Continental Formation and Destruction*, Berkeley CA, 2013 (chair),
    - *Dynamics of Mountain Building*, Berkeley CA, 2011 (instructor),
    - *Water and Volatiles in the Earth's Mantle and Core*, Santa Barbara CA, 2010 (instructor).
  – Summer short course on *Mapping and Modeling Earth Science Data*, Rome, 2012.
  – Summer short course on *Subduction Zone Modeling*, Rome, 2011.

◦ Teaching innovations:
  – At the University of Texas at Austin (UT GEOL codes in parentheses):
    - Co-created new undergraduate class *Lab to Planet* (with Flemings; Spring 2023)
    - Created new grad seminar *Global Planetary Dynamics* (391, Fall 2020)
    - Created new grad seminar *Physics and Chemistry of the Mantle* (with Grand and Lin; 391, Fall 2019)
    - Created new undergrad/grad class *Tectonic Geodynamics* (with Faccenna; 371T/391, 2019–2021; 2022), 730p. lecture notes.
    - Created new undergrad class *Sustaining a Planet* (with Gardner and Mohrig; 302P/J, 2018 – 2022)
    - Revised general education class *Introduction to Geology* (303, Spring 2017)
    - Created new undergrad/grad class *Introduction to Geodynamics* (371T/391, Fall 2017)
  – At the University of Southern California, Los Angeles (USC GEOL codes in parentheses, 2004–2016):
    - Revised general education class *Crises of a Planet* (108).
    - Revised geophysics section of undergrad class *Engineering Geology* (305L).

- Revised undergrad class *Geophysics* (440), including addition of new applied geophysics field work component in Death Valley.
- New undergrad class *Data Analysis in the Earth and Environmental Sciences* (425, with Emile-Geay).
- New graduate class *Lithospheric Deformation* (534, with Platt).
- New graduate class *The Mantle System* (540).
- New graduate class *Numerical Modeling of Earth Systems* (577, with Kaus). (222p. lecture notes and Matlab exercises)
- New graduate class *Inverse Theory in the Earth Sciences* (558).
- New graduate seminars on
  - *Subduction* (with Miller, Spring 2012),
  - *Plate Tectonics Over Time* (Fall 2006),
  - *The Deep Earth* (Spring 2009), and
  - *Strain Localization* (Fall 2009).

◦ Computing, visualization, and teaching in Earth Systems Science:

– Member, CIG Mantle convection and Lithospheric Dynamics working groups, 2010 – 2015.
– Project leader, open source project *Unified Earth Science Computing Environment* (UGESCE), http://www-udc.ig.utexas.edu/external/becker/ugesce.html, 2012 – 2016.
– Project leader, open source project *Solid Earth Research and Teaching Environment* (SEATREE), http://geosys.usc.edu/projects/seatree/, 2008 – 2016.
– Proposal Writing Committee for *Computational Infrastructure for Geodynamics* (CIG-II, geodynamics.org), 2008 – 2009.
– Project leader, open source project *iGMT*, http://www-udc.ig.utexas.edu/external/becker//igmt/, 1999 – 2009.

◦ Other outreach and community activities

– Guest speaker, science class, Lamar Middle School, Austin TX, May 2022.
– Austin Unified School District: Recorded micro-lectures for AISD TV for K12 instruction, October 2020.
– Host, RTX Undergraduate Research Experience, Jackson School of Geosciences, Summer 2019, 2021, 2022, 2023.
– Applicant evaluation committee, *Geodynamics of the Lithosphere and Deep Earth* REU program, 2016, 2017.
– Guest lecturer, Computer Science Curriculum, Cate High School, Carpinteria CA, November 2014.
– Art Gallery tour leader, *Michael Heizer: Actual Size*, Los Angeles County Museum of Art, September 2012.
– Co-Founder and steering committee, *Meeting of Young Researchers in the Earth Sciences (MYRES)*, 2002 – 2005.
– Fieldtrip Leader, Department of Earth and Planetary Sciences, Harvard University, Cambridge MA, 1999 – 2001.
– Departmental representative to the Graduate Student Council, Harvard University, Cambridge MA, 1998 – 2000.

- Web site maintenance for dissemination of research products such as developed software, and sharing of scientific visualizations, *e.g.* for popular science applications (used by museums and *Discover Magazine*, for example), 1997 –

- Journal reviewer for *Nature*, *Nature Geosc.*, *Nature Comm.*, *Science*, *Science Adv.*, *Geology*, *Earth Planet. Sci. Lett.*, *Tectonics*, *Geophys. J. Int.*, *J. Geophys. Res. - Solid Earth*, *G-Cubed*, *Geophys. Res. Lett.*, *Phys. Earth Planet. Int.*, *Tectonophys.*, *Lithosphere*, *Pure Appl. Geophys.*, *J. Geodynam.*, and *Adv. Geophys.*.
- Proposal reviewer for U.S. agencies: National Science Foundation (Geophysics, Tectonics, CSEDI, GeoPRISMS, MG&G, IES/CD, EarthScope, OCE, Geoinformatics, MRI, and CMG), NASA, Department of Energy Office of Science, United States Geological Survey, and the US-Civilian Research & Development Foundation.
- Proposal reviewer for international agencies and foundations: European Research Council (ERC), IODP, UK Natural Environment Research Council (NERC), Humboldt Foundation, German Science Foundation (DFG), German Academic Exchange Serice (DAAD), Agence National de la Recherche (France), Norwegian Science Foundation, Swiss Science Foundation, Israel Science Foundation, Czech Science Foundation, Canada's NSERC, ETH Zurich Research Commission, Netherland's NWO, Austria's FWF, The Royal Society of New Zealand, The Marsden Fund, and the Italian Ministry for Education, University and Research.
- Book and chapter reviewer for Cambridge University Press and Elsevier.

- The University of Texas at Austin
  - Member, Vice Provost for Research, Limited Submission Proposal Review Panel (2021, 2022, 2023)
  - Member, Vice Provost for Research, Proposal Review Panel (2020)
- Jackson School of Geosciences, UT Austin
  - Member, GSC Ad-hoc Committee on Parental Accommodations (2020 – 2021)
  - Chair, PLATES-4D Post-Doc Search Committee (2020)
  - Member, Promotion and Appointments Committee (2016 – 2019)
  - Member, UTIG Director Search Committee (2018 – 2019)
- Institute for Geophysics, UT Austin
  - Chair, Earthquake Hazards Post-doc Committee (2023 –)
  - Member, Research Professor Search Committee (2023 –)
  - Member, Technical Staff Evaluation Committee, (2023 –)
  - Chair, UTIG Endowed Postdoctoral Fellowship Committee (2021 – 2023)
  - Member, Awards Committee (2019 –)
  - Member, HPCC Committee (2016 –)
  - Member of four Researcher Mentoring Committees (2020 –)
  - Member, Research Scientist Search Committee (2021 – 2022)
  - Chair, Third Year Evaluation Committee (2021)
  - Chair, Computational Scientist Search Committee (2018 – 2019, 2020)
  - Lead, Promotion Committee (2020)
  - Member, Third Year Evaluation Committee (2019 – 2020)
  - Chair, UTIG Mentoring Committee (2016 – 2019)
  - Member, Annual Performance Evaluation Committee (2018 – 2019)
  - Member, Seminar Committee (2016 – 2019)
  - Chair, Promotion Committee (2018)
  - Chair, *Eleanor Picard Staff Excellence Award* Committee (2017)
  - Awards
    - *Outstanding Researcher Award*, 2023
    - *Director's Circle of Excellence*, 2016, 2017, 2021
- Department of Earth and Planetary Sciences, UT Austin
  - Chair, Comprehensive Tenure review case (2024)
  - Lead, Tenure Committee (2022 – 2023)
  - Member, Faculty Search Committee (2022 – 2023)
  - Member, Faculty Mentoring Committee (2021 –)
  - Member, Department Name Change Committee (2021 – 2022)
  - Member, Geophysics faculty search (2019)
  - Associate Chair (Member of Executive Committee, 2016 – 2018)
  - Member, Chaired Professorship review committee (2018 – 2022)
  - Program Lead, *Lithosphere and Deep Earth (LDE)* (2016 – 2018)
  - Peer teaching reviewer (2018 – 2019, 2020)
  - Chair, Structural Geology faculty search (2017 – 2018)
  - Chair, Annual Evaluation Committee for LDE (2016 – 2018)
  - Member, Tenure Committee (2017)

- Bureau of Economic Geology
  - Interviewer, Texnet Post-doc position (2022)
  - Interviewer, Center for Integrated Seismicity Research PI (2019)
  - Interviewer, RA Seismologist Search Committee (2018)
- Department of Earth Science, University of Southern California, Los Angeles
  - Member, Tenure Committee (2015)
  - Member, Merit Review committee (2015)
  - Member, Tenure Committee (2014)
  - Member, USC Earth Sciences Development delegation (2014)
  - Member, Faculty Promotion Committee (2013)
  - Chair, Climate Initiative Committee (2012 – 2013)
  - Member, Search Committee for Geophysics (2013 – 2014)
  - Member, Search Committee for Lithospheric Dynamics (2011 – 2012)
  - Member of two Faculty Mentoring Committees (2011 – 2015)
  - Member, Merit Review committee (2010)
  - Member, Search Committee for Climate Dynamics (2009 – 2010)
  - Member, Dean's *College 2020* proposal evaluation panel (2009, 2011)
  - Chair, Computing Committee (2008 – 2016).
  - Undergraduate program adviser (2009)
  - Member, Search Committee for Geophysics (2007 – 2008)
  - Member, Chair Search Advisory Committee (2006)
  - Member, Merit Review committee (2006)
  - Representative at *UNAVCO* (2006 – 2016)
  - Chair, Geophysics Search Committee (2006 – 2007)
  - Member, Computing Committee (2004 – 2008)
  - Representative at the *Computational Infrastructure for Geodynamics* (2004 – 2016)

- Summer undergraduate interns:
  - At UT Austin: Dorothy Linnemann (2017, Scripps College, with Lavier)
  - At USC: Fabienne Stockmann (2014, Münster University), Simon Schneider (2013, Münster University), Kevin Milner[35] (2008, USC), Jared Sain[35] (2008, USC), Hannah Waterhouse[35] (2008, Bryn Mawr College), and Katrin Plenkers (2005, Karlsruhe).
- Undergraduate advisees:
  - At UT Austin: Miles Mackenzie (research advisor, Physics, 2022–2023), Jake Goins (research committee member, 2020 – 2021), Zel Hurewitz (BSc 2019, Physics; grad school UCSD)
  - At USC: Bradford Foley[41] (BSc 2008; Assistant Professor, Penn State)
- MSc students:
  - At UT Austin: Antoine Demont (visiting from ENS Paris, 2020), Kunpeng Liao (MSc 2018; CGG)
  - At USC: Zi-Yu Wu (MSc 2010; Guosen Securities) and Claire Steedman[32] (MSc 2006; Iris Environmental)
- PhD students:
  - Supervised:
    - current: Ethan Conrad[152] (2019–, co-advisor), Edward Clennett[151] (2020–), Huiwen Sun (2022–).
    - At UT Austin: Wanying Wang[125] (PhD 2021; scientist at bp US), Erin Heilman[146] (PhD 2023; staff scientist at Los Alamos National Laboratory), Simone Puel[128,144,153] (PhD 2023; post-doc at Caltech)
    - At USC:
      - Adam Holt[87,89,90,92,105-107,113,115] (PhD 2016; Assistant Professor, U Miami)
      - Michael Kaplan (PhD 2015; post-doc, Duke; MD)
      - Mélanie Gérault[62,121] (PhD 2014; post-doc, MIT)
      - Thomas Goebel[61, 69, 75, 77, 80, 111] (PhD 2013; Assistant Professor, U Memphis)
      - Lisa Alpert[51,63,73] (PhD 2012; Aera Energy Llc.)
      - Iain Bailey[38,47,51,63] (PhD 2009; Swiss Re).
  - Committee service at The University of Texas at Austin:
    - Sohini Dasgupta (2023–), Avigyan Chatterjee (2021–), Chenyu Tian (2020–), Chujie Liu (2017–2023, PhD 2023), Keith Minor (2019–2022, PhD 2022), Juan Gutierrez (2021–2022), Eric Hiatt (2020–2021), Brandon Schuck (2018–2021, PhD 2021), Peter Nelson (2017–2020, PhD 2020), Alexandra Lachner (2019–2020), Yanyao Zhang (2018–2020), Kristina Butler (2018–2020), Chang Lu (2018–2020), Brooklyn Gose (2017–2020), and Lily R. Serach (2017–2019).

- Other PhD committee service:
  - At the University of Southern California, Los Angeles: Jessica Stellman[93] (2014–2020), William Schmidt (2015–2016), Beth Paulson (2014–2016), Xinjiang Xiang (2015), Xin Song (2014–2015), Xin Liu (2014–2015), Chris Milliner (2013–2015), Haoran Xia (2013–2015), Francoix Cadieux (PhD 2015), Feng Wang (PhD 2013), Prabu Sellappan (PhD 2013), Whitney Behr (PhD 2011), Zheqiang Shi (PhD 2008), Adam Fischer (PhD 2008), and Jeremy Zechar (PhD 2008).
  - External PhD reviewer: Christopher Mathews (ANU, 2021), Angela Maria Gomez Garcia (U Medellin, 2020), Juliane Dannberg (GFZ Potsdam, 2016), Raquibul Hassan (U Sydney, 2016), Rene Gassmöller (GFZ Potsdam, 2014), and Sabin Zahirovic (U Sydney, 2014).
  - Member of the Board, International Graduate School, Department of Earth Sciences, Universita di Roma TRE, 2014–2022.
- Post-doc mentoring:
  - Chuanming Liu (2023 –)
  - Kaixuan Kang (2023 –)
  - Junlin Hua[149] (2022 – 2024; post-doc, Brown; co-advised with Steve Grand)
  - Antoniette Grima (2020–2022; Assistant Professor, University of Glasgow)
  - Eivind Straume[155] (2021–2023; Post-Doc, University of Bergen)
  - Silvia Brizzi[141] (2020–2022; Post-Doc, U Roma TRE)
  - Rob Porritt[88,100,124,140] (2017–2019; Research Scientist, Sandia).
  - Matt Weller[122] (2016–2019; Research Scientist, LPI)
  - Lukas Fuchs[122,125,135,147,154] (2016–2018; Research Scientist, U. Frankfurt)
  - Attreyee Ghosh[44, 68] (2008–2010; Associate Professor, Indian Institute of Science, Bangalore)
  - Boris Kaus[20,31-33,40,62] (2005–2006; Professor, Mainz University)
  - Jules Browaeys[22] (2006; Geophysicist, Total E&P Norge AS)

CLASSES TAUGHT

- *Physics of Earth* (UT GEO 354/384D): S24
  Undergraduate major and grad class providing an introduction to the theoretical and observational fundamentals for an understanding of how the solid Earth works.
- *Earth from Lab to Planet* (UT GEO 315L): S24 (with Flemings)
  Hands on undergraduate class on how we can use lab and computer experiments to get at the laws how things deform and upscale this to our planet.
- *Crisis of a Planet* (UT GEO 302P/J): S18, S19, S20, S21, S22 (with Gardner and Mohrig)
  General education undergraduate class on all aspects of natural hazards.
- *Tectonic Geodynamics* (UT GEO 350L/398L): S19, S20, S21 (with Faccenna), S22

Introduction to structural geology, tectonics, and lithospheric geodynamics for undergraduate majors and grad students (760p. lecture notes).

- *Geoscientific data analysis using UNIX and GMT*: S21
  Short course on UNIX, shell scripts, programming, data analysis and visualization with focus on geoscience applcations.
- *Global Solid Earth Dynamics* (UT GEO 391): F20
  Graduate seminar on terrestrial planet and exoplanet mantle, climate, and biosphere coevolution, from the geodynamo to the carbon cycle.
- *Physics and Chemistry of the Mantle* (UT GEO 391): F19 (with Grand and Lin)
  Graduate seminar on deep mantle dynamics and chemistry.
- *Introduction to Geodynamics* (UT GEO 371T/391): F17
  Introduction to mantle and lithospheric geodynamics for undergraduate majors and grad students.
- *Introduction to Geology* (UT GEO 303): S17 (with Shanahan)
  General education undergraduate class on all aspects of Geology.
- *Crisis of a Planet* (USC GEOL108): F11 (with Berelson), F12, F13, F14, F15 (with Miller)
  General education undergraduate class on natural hazards and global change.
- *Engineering Geology* (USC GEOL305L): S07, S09, S10, S12, S13, S14, S15 (all with Davis and Hammond)
  Non-major undergraduate class on the solid Earth with focus on hazards and mitigation.
- *Introduction to Geophysics* (USC GEOL440): S05, S14, S16
  Advanced undergraduate and introductory grad class, includes applied geophysics field trip (seismics and gravity methods).
- *Data analysis in the Earth Sciences* (USC GEOL425): F09 (with Emile-Geay)
  Introduction to statistics, inverse theory, and time-series analysis for advanced undergraduates and graduate students.
- *Introductory Graduate Seminar* (USC GEOL505): F11
  Introduction to research methods and general academic skills including proposal and presentation preparation.
- *Mechanics of Lithospheric Deformation* (USC GEOL534): S06, F07, F09, F11, F14 (all with Platt)
  Introductory graduate class on the mechanics and dynamics of the lithosphere and mantle.
- *The Mantle System* (USC GEOL540): S09
  Advanced graduate class on the dynamics and structure of the deep Earth.
- *Numerical Modeling of Earth Systems* (USC GEOL557): F05 (with Kaus), F08, S13, S16
  Avanced graduate class on PDE and ODE solution methods with extensive programming exercises focusing on finite difference and element methods (222p. lecture notes).
- *Subduction* (USC GEOL599): S12 (with Miller)
  Graduate seminar on the dynamics and structure of subduction zones with focus on data rich environments like USArray imaged North America, Japan, and China.
- *Plate tectonics over time* (USC GEOL599): F06
  Graduate seminar on geological, petrological, and geophysical constraints on Earth's heat loss dynamics over the last four billion years.
- *Strain localization* (USC GEOL599): F09 (with Ben-Zion)

Graduate seminar on the role of brittle and ductial damage and grain-size dependent rheologies for the formation of plate boundaries.

- *Geophysics Seminar* (USC GEOL609): F05, S06, S07 (all with Ben-Zion)
  Graduate seminar on the physics of earthquakes, faults and plate boundaries.
- *The Global Economy 2030* (USC IR331): F13, F14, F15 (guest lectures)
  Regular guest lecture in International Relations class.
- *Mapping and Modeling Earth Science Data* (June 2012)
  International short course on computing, UNIX, programming, and visualization as well as analysis of geographic data. Part of the Geodynamics Graduate School at the Universitá di Roma TRE.
- *Subduction zone modeling* (April 2011)
  International short course on modeling of slab dynamics on regional on global scales. Part of the Geodynamics Graduate School at the Universitá di Roma TRE.
- *Short courses on scientific computing, programming, and mapping* (Su05, F06, Su09, S12)
  Introduction to computing, UNIX, programming, and visualization and analysis of geographic data.

FUNDING HISTORY

- Current support (local components for multi-institution proposals):
  - *Collaborative Research: Toward an integrated modeling framework for physics-based estimates of megathrust rupture potential*
    NSF, EAR-2121666, $1,866,458 (UT portion). PI, co-PIs: Gabriel, Ghattas, Han, Johnson, Lavier, May, Trugman, Wallace, 09/01/2021 – 08/31/2026.
  - *Collaborative Research: Vertical signatures of lithospheric deformation in the western US*
    NSF, EAR-2045292, $358,157. Co-PI, with K. Johnson (PI), 08/01/2021 - 07/31/2024.
  - *Collaborative Research: Structure and depth extent of lithospheric shear zones surrounding continental transform faults*
    NSF, EAR-1927216, $300,800. PI, with V. Schulte-Pelkum (co-PI), 10/01/2019 - 09/30/2024.
  - *Collaborative Research: Consequences of flat slab subduction on the chemical, structural, and dynamic evolution of continental lithosphere*
    NSF, EAR-1925939, $1,137,854. Co-PI, with L. Wagner (PI), C. Till, and B. Horton, 09/01/2019 – 08/31/2024.
  - *Collaborative Research: Resolving earth structure influence on ice-sheet stability in the Wilkes Subglacial Basin (RESISSt)*
    NSF, EAR-19214743, $114,952. Co-PI, with P. Winberry (PI), A. Aschwanden, and S. E. Hansen, 08/15/2020 - 07/31/2024.
  - *RCN: Planning for a Modeling Collaboratory for Subduction Zone Science*
    NSF, EAR-1824343, $400,000. PI. 09/01/2018 – 09/30/2024.
- Past support:
  - *Global plate tectonics and mantle convection with damage memory*
    NSF, EAR-1853856, $375,000. PI. 03/15/2019 – 02/28/2024.

– *Building a viscous mantle rheology model for Southern California constrained by tomography and postseismic deformation*
NSF/USGS-SCEC. $13,000. Co-PI, with K. Johnson (PI), 02/2020 – 01/2021.
– *Collaborative Research: RAPID: Using the M6.4-7.1 Ridgecrest, CA Earthquake sequence to test a postseismic stress evolution monitoring system*
NSF, EAR-1944717, $14,000. Co-PI, with K. Johnson (PI). 08/2019 – 07/2020.
– *Collaborative Research: Multi-scale models of subduction zone earthquake cycle observations*
NSF, EAR-1722680, $233,467. PI, co-PIs L. Lavier and A. Freed. 07/2017 – 06/2020.
– *Interpreting crustal and lithospheric structure in the Eastern California Shear Zone underneath the Mojave Broadband Array*
NSF/USGS-SCEC. $22,000. PI, with V. Schulte-Pelkum (co-PI), 02/2019 – 01/2020.
– *Geophysical fingerprinting of GPS time series in the western United States: Toward an integrated crustal deformation model*
NASA, OSP 201601412-001, $523,619. PI. 06/2016 – 07/2020.
– *Computing 3-D viscoelastic Greens functions using SCEC Community Models and large-scale, high fidelity finite element models*
NSF/USGS-SCEC. $17,500. co-PI, with K. Johnson (PI). 02/2019 – 01/2019.
– *Collaborative deployment of UTIG seismometers in the Eagle Ford Play (South Texas)*
University of Texas at Austin, Bureau of Economic Geology. $86,641. PI. 09/2018 – 12/2019.
– *Coupling interior and surface deformation of ice shells*
NASA Solar System Workings Program, $147,105, co-PI with K. Soderlund (PI) and L. Lavier (co-PI). 01/2018 – 12/2018.
– *Collaborative Research: Shear-wave splitting and mantle dynamics of the North American plate*
NSF-EarthScope, EAR-1460479, $150,485. Co-PI, with K. Liu (PI). 07/2015 – 06/2019.
– *Workshop on coupling of tectonic and surface processes across spatio-temporal scales*
NSF, EAR-1746021, $95,152. Co-PI, with L. Lavier (PI) and M. Behn, 09/2017 – 08/2018.
– *Deep Fault Structure Beneath the Mojave from a High Density, Passive Seismic Profile*
NSF/USGS-SCEC. $22,000. Co-PI, with W. Behr (PI), 05/2017 – 04/2018.
– *Earth-Life Transitions: Linked geochemical/biotic response to massive volcanic CO_2 injection during the Triassic-Jurassic mass extinction*
NSF, EAR-1338329, $700,000. Co-PI, with F. A. Corsetti (PI), A. J. West, N. M. Levine, and D. J. Bottjer. 08/2013 – 07/2017.
– *Transitions in the Banda Arc-Australia continental collision as a bridge to understanding mantle and lithospheric controls on surface tectonics*
NSF-Geophysics/Tectonics, EAR-1250214, $715,000. Co-PI, with M. S. Miller (PI) and J. West. 07/2013 – 06/2016.
– *Anticipating SCEC5: Towards a Community Rheology Model (CRM) of the Southern California Lithosphere*
NSF-USGS/SCEC, $10,000. PI L. Hearn, co-PIs: Becker, Y. Fialko, G. Fuis, G. Hirth, W. Thatcher, 02/2015 – 01/2016.
– *Reprocessing and geophysical fingerprinting of vertical GPS time series in Southern California: Toward an integrated crustal deformation model*

NSF-USGS/SCEC, $30,000. PI A. Borsa, co-PI: Becker, 02/2015 – 01/2016.
- *Multi-scale stress and strain-rate model analysis for Southern California*
  NSF-USGS/SCEC, $21,000. PI, 02/2015 – 01/2016.
- *Lithospheric System Dynamics Graduate Student Scholarship Support Sustaining Chevron-USC Earth Sciences Research Collaboration*. CW994042. Chevron, $90,000, PI. 08/2014 – to 12/2015.
- *Estimating global subduction mass transport*
  NSF-Geophysics. EAR-1215720, $301,618. PI. 09/2012 – 08/2015.
- *Collaborative Research: Reorganization of stresses beneath greater Tokyo after the 2011 Tohoku-Oki M9 earthquake*
  NSF-Geophysics, EAR-1215757, $325,146. Co-PI, with D. Okaya (PI) and A. Freed (Purdue). 07/2012 – 06/2015.
- *Community Stress Model (CSM) Workshop*
  NSF-USGS/SCEC, $12,000. co-PI, with J. Hardebeck et al., 02/2014 – 01/2015.
- *Multi-scale observations of seismic anisotropy as a constraint for stress and deformation along the San Andreas Fault*
  NSF-USGS/SCEC, $30,000. co-PI, PI: M. S. Miller, 02/2014 – 01/2015.
- *2014 SCEC/ERI summer school on Earthquake System Modeling*
  NSF-USGS/SCEC, $40,000. PI, co-PIs: T. Jordan, G. Beroza, 02/2014 – 01/2015.
- *Workshop: Crustal Deformation Modeling*
  NSF-USGS/SCEC, $10,000. co-PI, with B. Aagaard et al., 02/2014 – 01/2015.
- *Embedded geodynamic stress model of the Southern California crust*
  NSF-USGS/SCEC, $30,000. PI, co-PI: T. Parsons, 02/2014 – 01/2015.
- *Continued study of fault mechanics and structure during laboratory stick-slip experiments*
  NSF-USGS/SCEC, $30,000. PI, with C. Sammis. 02/2013 – 01/2014.
- *Weakening, strain localization, and the deep structure of the San Andreas Transform system*
  NSF-USGS/SCEC, $27,000. co-PI, with J. P. Platt (PI). 02/2013 – 01/2014.
- *Community Stress Model Web Interface*
  NSF-USGS/SCEC, $30,000. PI, with J. Hardebeck. 02/2013 – 01/2014.
- *PICASSO: Program to Investigate Convective Alboran Sea System Overturn*
  NSF–Continental Dynamics, EAR-0809023, $275,000. Co-PI, with J. P. Platt and M. S. Miller, 10/2008 – 12/2013.
- *CAREER: Using Upper Mantle Circulation Models to Evaluate the Role of the Asthenosphere:Tectosphere Contrast and Subduction Dynamics for Global Plate Tectonics*
  NSF–Geophysics, EAR-0643365, $511,291. PI. 01/2007 – 12/2012.
- *Steps in lithospheric thickness: Investigating strain localization at major strike slip faults in Southern California*
  NSF-USGS/SCEC, $30,000. Co-PI, with M.S. Miller and J. Dolan. 02/2012 – 01/2013.
- *Fault mechanics and structure during laboratory stick-slip experiments: Can we infer fault properties and stress from acoustic emission statistics?*
  NSF-USGS/SCEC, $30,000. PI, with C. Sammis. 02/2012 – 01/2013.
- *Stress transfer and the structure of lithospheric fault zones?*
  NSF-USGS/SCEC, $30,000. Co-PI, with J. P. Platt. 02/2012 – 01/2013.
- *Collaborative Research: Geodynamic implications of imaged upper mantle heterogeneity beneath the Western United States*
  NSF EAR-0910985, $156,124, PI, with E. Humphreys, 09/2009 – 08/2012.

– *Characterizing fault roughness evolution using acoustic emission and micro-structural analysis of frictional sliding experiments*
NSF/USGS–Southern California Earthquake Center, $20,000. PI, with D. Schorlemmer and G. Dresen. 02/2011 – 01/2012.
– *Collaborative Research: Thermochemical Models of Mantle Dynamics and Plate Motions*
NSF-Geophysics, EAR-0930046, $88,885. Co-PI, with B. Buffett. 08/2009 – 07/2012.
– *Bookshelf slip on rotating panels of sinistral faults within the San Andreas Transform system: Can we see the geodetic signal?*
NSF/USGS–Southern California Earthquake Center, $15,000. Co-PI, with Platt. 02/2010 – 01/2011.
– *Network Inversion Filter with Multiscale Dynamics*
NSF/USGS–Southern California Earthquake Center, $10,000. PI, with Ghanem, 02/2010 – 01/2011.
– *Multi-Disciplinary Experiments for Dynamic Understanding of Subduction under the Aegean Sea (MEDUSA)*
NSF–Continental Dynamics, EAR-0633879, $132,760. Co-PI, with L. Royden, 08/2004 – 07/2009.
– *The 3-D strain-rate field in California and its implications for seismic hazard*
USGS-NEHRP, G09AP00005, $71,113. PI. 01/2009–12/2009.
– *Continued Modeling of Southern California Geodynamics in 3-D: Visco-plastic Models of Fault Loading and Crustal Stress*
NSF/USGS–Southern California Earthquake Center, $35,000. PI. 02/2009 – 01/2010.
– *Seismological and Geodynamic Investigations of Mantle Anisotropy*
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