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EDUCATION

1997 – 2002	Harvard University <i>Ph. D. in Geophysics</i> , June 2002	Cambridge, MA
1992 – 1997	J. W. Goethe University <i>Diplom (M. Sc.) in Physics</i> , May 1997	Frankfurt am Main

PROFESSIONAL APPOINTMENTS

2016 –	The University of Texas at Austin <i>Shell Foundation Distinguished Chair in Geophysics</i>	Austin, TX
2004 – 2016	University of Southern California <i>Assistant (2004–2009), Associate (2009–2012), Professor of Earth Sciences (2012–2016)</i>	Los Angeles, CA
2002 – 2004	Scripps Institution of Oceanography, U.C. San Diego <i>Cecil H. and Ida M. Green Postdoctoral Scholar at IGPP</i>	La Jolla, CA

VISITING APPOINTMENTS

Summer 2012	Università di Roma TRE, <i>Visiting Professor</i>	Rome
Fall 2010	University of Tokyo, <i>Visiting Associate Professor</i>	Tokyo
Spring 2008	Princeton University, <i>Visiting Fellow</i>	Princeton, NJ

ACADEMIC HONORS

- Fellow, American Geophysical Union, 2015.
- Astor Visiting Fellowship, Oxford University, 2014.
- Friedrich Wilhelm Bessel Award, Humboldt Foundation, 2013.
- C. F. Gauss lecturer, German Geophysical Society, 2008.
- Kavli fellow, National Academy of Sciences, 2007.
- Editor's Citation for Excellence in Refereeing for *Tectonics*, 2007.
- CAREER Award, National Science Foundation, 2007.
- Cecil H. and Ida M. Green Scholarship, Scripps, UCSD, 2002 – 2004.
- Certificate of Excellence in Teaching, Derek Bok Center, Harvard University, 2001.
- Ph. D. Scholarship, German Academic Exchange Service (DAAD), 1998 – 2001.
- Siedler Award for the best M. Sc. thesis in Physics at Frankfurt University, 1997.
- Haereus Prize for successful course of studies in Physics in the state of Hesse, 1997.

- 118 Jolivet, L., Faccenna, C., **Becker, T. W.**, Tesauro, M., Sernai, P., and Bouihol, P. (2018): Mantle flow and deforming continents: From India-Asia convergence to Pacific subduction. *Tectonics*, doi:10.1029/2018TC005036.
- 117 Holt, A. F.*, 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.
- 116 Jackson, M. G., **Becker, T. W.**, and Konter, J. (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.
- 115 Faccenna, C., Holt, A. F.*, **Becker, T. W.**, Lallemand, S., and Royden, L. H. (2017): Dynamics of the Ryukyu/Izu-Bonin-Marianas double subduction system. *Tectonophysics*, doi:10.1016/j.tecto.2017.08.011.
- 114 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, doi:10.1002/2017GL073981.
- 113 Goebel, T. H. W., Kwiatak, 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.
- 112 **Becker, T. W.** (2017): Superweak asthenosphere in light of upper-mantle seismic anisotropy, *Geochem., Geophys., Geosys.*, 18, 1986–2003, doi:10.1002/2017GC006886.
- 111 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, doi:10.1002/2017GL072668.
- 110 Jackson, M. G., Konter, J. G., and **Becker, T. W.** (2017): Primordial helium entrained by the hottest mantle plumes. *Nature*, 542, 340–343.
- 109 Holt, A. F.*, Royden, L. H., and **Becker, T. W.** (2017): The dynamics of double slab subduction. *Geophys. J. Int.*, 209, 250–265.
- 108 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.
- 107 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.
- 106 Freed, A. M., Hashima, A.* , **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.
- 105 Hashima, A.* , **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.)
- 104 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.

- 103 Steinberger, B. and **Becker, T. W.** (2016): A comparison of lithospheric thickness models. *Tectonophys.*, doi:10.1016/j.tecto.2016.08.001. (14 p.)
- 102 Miller, M. S., O'Driscoll, L. J.*, Roosmawati, N., Harris, C. W.*, Porritt, R. W.*, 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.)
- 101 Gvirtzman, Z., Faccenna, C., and **Becker, T. W.** (2016): Isostasy, flexure, and dynamic topography. *Tectonophys.*, 683, 255–271.
- 100 Sternai, P., Avouac, J.-P., Jolivet, L., Faccenna, C., Gerya, T., **Becker, T. W.**, and Menant, A. (2016): Sub-crustal forcing on the tectonics and topography along the eastern Tibetan margin. *J. Geodyn.*, 184–197.
- 99 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, doi:10.1002/2015TC004000.
- 98 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, doi:10.1002/2015GL066246.
- 97 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, doi:10.1038/srep16493. (10 p.)
- 96 **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.
- 95 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, doi:10.2110/sedred.2015.2.
- 94 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, doi:10.1002/2015GL063834.
- 93 **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, doi:10.1002/2015GL063695.
- 92 Jagoutz, O., Royden, L., Holt, A. F.*, and **Becker, T. W.** (2015): Anomalously fast convergence between India and Eurasia caused by double subduction. *Nature Geosc.*, 8, 475–478.
- 91 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.
- 90 Porritt, R. W.*, **Becker, T. W.**, and Monsalve, G. (2014): Seismic anisotropy and slab dynamics from SKS splitting recorded in Colombia. *Geophys. Res. Lett.*, 41, 8775–8783, doi:10.1002/2014GL061958.

- 89 Sun, D.* , 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, doi:10.1002/2014GL061884.
- 88 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. *Tectonophysics*, *637*, 57–67.
- 87 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.
- 86 **Becker, T. W.**, Conrad, C. P., Schaeffer, A. J., and Lebedev, S. (2014): Origin of azimuthal seismic anisotropy in oceanic plates and mantle. *Earth Planet. Sci. Lett.*, *401*, 236–250.
- 85 Schmandt, B., Jacobsen, S. D., **Becker, T. W.**, Liu, Z., and Dueker, K. G. (2014): Dehydration melting at the top of the lower mantle. *Science*, *334*, 1265–1268.
- 84 Faccenna, C., **Becker, T. W.**, Auer, L.* , Billi, A., Boschi, L., Brun, J.-P., Capitanio, F. A., Funiciello, F., Horvath, F., Jolivet, L., Piromallo, C., Royden, L., Rossetti, F., and Serpelloni, E. (2014): Mantle dynamics in the Mediterranean. *Rev. Geophys.*, *52*, 283–332, doi:10.1002/2013RG000444.
- 83 Miller, M. S. and **Becker, T. W.** (2014): Reactivated lithospheric-scale discontinuities localize dynamic uplift of the Moroccan Atlas Mountains: Comment – Reply. *Geology*, *42*, 338.
- 82 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.
- 81 Auer, L.* , Boschi, L., **Becker, T. W.**, Nissen-Meyer, T. and Giardini, D. (2014): Savani: a variable-resolution whole-mantle model of anisotropic shear-velocity variations based on multiple datasets. *J. Geophys. Res.*, *119*, 3006–3034, doi:10.1002/2013JB010773.
- 80 **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.
- 79 Goebel, T. H. W.* , Candela, T., Sammis, C. G., **Becker, T. W.**, Dresen, G., and Schorlemmer, D. (2014): Seismic event distributions and off-fault damage during frictional sliding of saw-cut surfaces with predefined roughness. *Geophys. J. Int.*, *196*, 612–625.
- 78 Miller, M. S. and **Becker, T. W.** (2014): Reactivated lithospheric-scale discontinuities localize dynamic uplift of the Moroccan Atlas Mountains. *Geology*, *42*, 35–38, 2014.
- 77 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.)
- 76 Yamato, P., Husson, L., **Becker, T. W.**, and Pedoja, K. (2013): Passive margins getting squeezed in the mantle convection vice. *Tectonics*, *32*, 1599–1570, doi:10.1002/2013TC003375.
- 75 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, doi:10.1002/jgrb.50309.

- 74 Faccenna, C., **Becker, T. W.**, Jolivet, L., and Keskin, M. (2013): Mantle convection in the Middle East: Reconciling Afar upwelling, Arabia indentation and Aegean trench rollback. *Earth Planet. Sci. Lett.*, 375, 254–269.
- 73 Miller, M. S., Allam, A. A.* , **Becker, T. W.**, Di Leo, J., and Wookey, J. (2013): Constraints on the geodynamic evolution of the westernmost Mediterranean and northwestern Africa from shear wave splitting analysis. *Earth Planet. Sci. Lett.*, 375, 234–243.
- 72 Platt, J. P. and **Becker, T. W.** (2013): Kinematics of rotating panels of E-W faults in the San Andreas system: what can we tell from geodesy? *Geophys. J. Int.*, 194, 1295–1301.
- 71 Goebel, T. H. W.* , Schorlemmer, D., **Becker, T. W.**, Dresen, G., and Sammis, C. G. (2013): Acoustic emissions document stress changes over many seismic cycles in stick-slip experiments. *Geophys. Res. Lett.*, 40, 2049–2054, doi:10.1002/grl.50507.
- 70 Ghosh, A.* , **Becker, T. W.**, and Humphreys, E. D. (2013): Dynamics of the North American continent. *Geophys. J. Int.*, 194, 651–669.
- 69 Faccenna, C., **Becker, T. W.**, Conrad, C. P., and Husson, L. (2013): Mountain building and mantle dynamics. *Tectonics*, 32, 80–93, doi:10.1029/2012TC003176.
- 68 Steinberger, B., Torsvik, T. H., and **Becker, T. W.** (2012): Subduction to the lower mantle - a comparison between geodynamic and tomographic models. *Solid Earth*, 3, 415–432.
- 67 Miller, M. S. and **Becker, T. W.** (2012): Mantle flow deflected by interactions between subducted slabs and cratonic keels. *Nature Geosci.*, 5, 726–730.
- 66 Buffett, B. and **Becker, T. W.** (2012): Bending stress and dissipation in subducted lithosphere. *J. Geophys. Res.*, 117, B05413, doi:10.1029/2012JB009205. (10 p.)
- 65 Bailey, I. W.* , Alpert, L. A.* , **Becker, T. W.**, and Miller, M. S. (2012): Co-seismic deformation of deep slabs based on summed CMT data. *J. Geophys. Res.*, 117, B04404, doi:10.1029/2011JB008943. (19 p.)
- 64 G rault, M.* , **Becker, T. W.**, Kaus, B. J. K., Faccenna, L., Moresi, L. N., and Husson, L. (2012): The role of slabs and oceanic plate geometry for the net rotation of the lithosphere, trench motions, and slab return flow. *Geochem., Geophys., Geosys.*, 13, Q04001, doi:10.1029/2011GC003934, 2012. (23 p.)
- 63 Goebel, T. H. W.* , **Becker, T. W.**, Schorlemmer, D., Stanchits, S., Sammis, C., Rybacki, E., and Dresen, G. (2012): Identifying fault heterogeneity through mapping spatial anomalies in acoustic emission statistics. *J. Geophys. Res.*, 117, B03310, doi:10.1029/2011JB008763. (18 p.)
- 62 **Becker, T. W.** (2012): On recent seismic tomography for the western United States. *Geochem., Geophys., Geosys.*, 13, Q01W10, doi:10.1029/2011GC003977. (11 p.)
- 61 Konter, J. and **Becker, T. W.** (2012): Shallow lithospheric contribution to mantle plumes revealed by integrating seismic and geochemical data. *Geochem., Geophys., Geosys.*, 13, Q02004, doi:10.1029/2011GC003923. (14 p.)
- 60 Faccenna, C., **Becker, T. W.**, Lallemand, S., and Steinberger, B. (2012): On the role of slab pull in the Cenozoic motion of the Pacific. *Geophys. Res. Lett.*, 39, L03305, doi:10.1029/2011GL050155. (6 p.)
- 59 **Becker, T. W.**, Lebedev, S., and Long, M. D. (2012): On the relationship between azimuthal anisotropy from shear wave splitting and tomographic models. *J. Geophys. Res.*, 117, B01306, doi:10.1029/2011JB008711. (17 p.)

- 58 Schaefer, J. F., Boschi, L., **Becker, T. W.**, and Kissling, E. (2011): Radial anisotropy in the European mantle: Tomographic studies explored in terms of mantle flow. *Geophys. Res. Lett.*, *38*, L23304, doi:10.1029/2011GL049687. (5 p.)
- 57 Boschi, L. and **Becker, T. W.** (2011): Vertical coherence in mantle heterogeneity from global seismic data. *Geophys. Res. Lett.*, *38*, L20306, doi:10.1029/2011GL049281. (5 p.)
- 56 **Becker, T. W.** and Faccenna, C. (2011): Mantle conveyor beneath the Tethyan collisional belt. *Earth Planet. Sci. Lett.*, *310*, 454–461.
- 55 **Becker, T. W.** and Kawakatsu, H. (2011): On the role of anisotropic viscosity for plate-scale flow. *Geophys. Res. Lett.*, *38*, L17307, doi:10.1029/2011GL048584. (5 p.)
- 54 **Becker, T. W.** (2011): Seismic anisotropy. In *Encyclopedia of Solid Earth Geophysics*, Gupta, H. (Ed.), doi:10.1007/978-90-481-8702-7_51, p. 1070–1081, Springer.
- 53 Alpert, L. A.* , **Becker, T. W.**, and Bailey, I. W.* (2010): Global coseismic subduction zone strain-release as a constraint for slab dynamics. *Geochem., Geophys. Geosys.*, *11*, Q12006, doi:10.1029/2010GC003301. (22 p.)
- 52 Boschi, L., Faccenna, C., and **Becker, T. W.** (2010): Mantle structure and dynamic topography in the Mediterranean Basin. *Geophys. Res. Lett.*, *37*, L20303, doi:10.1029/2010GL045001. (6 p.)
- 51 Faccenna, C., **Becker, T. W.**, Lallemand, S., Lagabriele, Y., Funiciello, F., and Piromallo, C. (2010): Subduction-triggered magmatic pulses. A new class of plumes? *Earth Planet. Sci. Lett.*, *209*, 54–68.
- 50 Bull, A. L., McNamara, A. K., **Becker, T. W.**, and Ritsema, J. (2010): Global scale models of the mantle flow field predicted by synthetic tomography models. *Phys. Earth Planet. Int.*, *182*, 129–138.
- 49 Bailey, I. W.* , Ben-Zion, Y., **Becker, T. W.**, and Holschneider, M. (2010): Quantifying focal mechanism heterogeneity for fault zones in central and southern California. *Geophys. J. Int.*, *183*, 267–276.
- 48 **Becker, T. W.** (2010): Fine-scale modeling of global plate tectonics. *Science*, *329*, 1020–1021.
- 47 Long, M. D. and **Becker, T. W.** (2010): Mantle dynamics and seismic anisotropy. *Earth Planet Sci. Lett.*, *297*, Frontiers, 341–354.
- 46 Platt, J. P. and **Becker, T. W.** (2010): Where is the real transform boundary in California? *Geochem., Geophys., Geosys.*, *11*, Q06013, doi:10.1029/2010GC003060. (19 p.)
- 45 Faccenna, C. and **Becker, T. W.** (2010): Shaping mobile belts by small-scale convection. *Nature*, *465*, 602–605.
- 44 Ghosh, A.* , **Becker, T. W.**, and Zhong, S. (2010): Effects of lateral viscosity variations on the geoid. *Geophys. Res. Lett.*, *37*, L01301, doi:10.1029/2009GL040426. (6 p.)
- 43 Foley, B.* and **Becker, T. W.** (2009): Generation of plate-like behavior and mantle heterogeneity from a spherical, visco-plastic convection model. *Geochem., Geophys., Geosys.*, *10*, Q08001, doi:10.1029/2009GC002378. (20 p.)
- 42 Kaus, B. J. P.* , Liu, Y., **Becker, T. W.**, Yuen, D., and Shi, Y. (2009): Lithospheric stress-states predicted from long-term tectonic models: influence of rheology and possible application to Taiwan. *J. Asian Earth Sci.*, *36*, 119–134.

- 41 Castelnau, O., Blackman, D. K. and **Becker, T. W.** (2009): Numerical simulations of texture development and associated rheological anisotropy in regions of complex mantle flow. *Geophys. Res. Lett.*, 36, L12304, doi:10.1029/2009GL038027. (6 p.)
- 40 Bailey, I. W.*, **Becker, T. W.**, and Ben-Zion, Y. (2009): Patterns of co-seismic strain computed from southern California focal mechanisms. *Geophys. J. Int.*, 177, 1015–1036.
- 39 **Becker, T. W.** and Faccenna, C. (2009): A review of the role of subduction dynamics for regional and global plate motions. In: *Subduction Zone Geodynamics, Int. J. Earth Sci.*, 3–34, Springer Verlag, Berlin. (www-udc.ig.utexas.edu/external/becker/preprints/bf07.pdf)
- 38 Qin, Y., Capdeville, Y., Montagner, J.-P., Boschi, L., and **Becker, T. W.** (2009): Reliability of mantle tomography models assessed by spectral-element simulation. *Geophys. J. Int.*, 177, 125–144.
- 37 Milner, K.[×], **Becker, T. W.**, Boschi, L., Sain, J.[×], Schorlemmer, D. and H. Waterhouse[×] (2009): The Solid Earth Research and Teaching Environment: a new software framework to share research tools in the classroom and across disciplines. *Eos Trans. AGU*, 90, 12 (1 p.).
- 36 **Becker, T. W.**, Conrad, C. P., Buffett, B. and Müller, R. D. (2009): Past and present seafloor age distributions and the temporal evolution of plate tectonic heat transport. *Earth Planet. Sci. Lett.*, 278, 233–242.
- 35 Kaus B. J. P.* and **Becker T. W.** (2008): A numerical study on the effects of surface boundary conditions and rheology on slab dynamics. *Bolletino di Geofisica*, 49(2), 177–182.
- 34 Kaus, B. J. P.*, Steedman, C.*, and **Becker, T. W.** (2008): From passive continental margin to mountain belt: insights from analytical and numerical models and application to Taiwan. *Physics Earth Planet. Int.*, 171, 235–251.
- 33 Platt, J. P., Kaus, B. J. P.*, and **Becker, T. W.** (2008): The mechanics of continental transforms: An alternative approach with applications to the San Andreas system and the tectonics of California. *Earth Planet. Sci. Lett.*, 274, 380–391.
- 32 Faccenna, C., Rossetti, F., **Becker, T. W.**, Danesi, S., and Morelli, A. (2008): Recent extension driven by mantle upwelling at craton edge beneath the Admiralty Mountains (Ross Sea, East Antarctica). *Tectonics*, 27, TC4015, doi:10.1029/2007TC002197, 2008. (13 p.)
- 31 Funicello, F., Faccenna, C., Heuret, A., Di Giuseppe, E., Lallemand, S., and **Becker, T. W.** (2008): Trench migration, net rotation and slab-mantle coupling. *Earth Planet. Sci. Lett.*, 271, 233–240.
- 30 Boschi, L., **Becker, T. W.**, and Steinberger, B. (2008): On the statistical significance of correlations between synthetic mantle plumes and tomographic models. *Physics Earth Planet. Int.*, 167, 230–238.
- 29 **Becker, T. W.** (2008): Azimuthal seismic anisotropy constrains net rotation of the lithosphere. *Geophys. Res. Lett.*, 35, L05303, doi:10.1029/2007GL032928. (5 p.)
- 28 **Becker, T. W.**, Kustowski, B., Ekström, G. (2008): Radial seismic anisotropy as a constraint for upper mantle rheology. *Earth Planet. Sci. Lett.*, 267, 213–227.
- 27 Boschi, L., **Becker, T. W.**, and Steinberger, B. (2007): Mantle plumes: dynamic models and seismic images. *Geochem. Geophys. Geosyst.*, 8, Q10006, doi:10.1029/2007GC001733. (20 p.)
- 26 **Becker, T. W.**, Ekström, G., Boschi, L., and Woodhouse, J. (2007): Length scales, patterns, and origin of azimuthal seismic anisotropy in the upper mantle as mapped by Rayleigh waves. *Geophys. J. Int.*, 171, 451–462.

- 25 Loyd, S. J.*, **Becker, T. W.**, Conrad, C. P., Lithgow-Bertelloni, C., and Corsetti, F. A. (2007): Time-variability in Cenozoic reconstructions of mantle heat flow: plate tectonic cycles and implications for Earth's thermal evolution. *Proceed. Nat. Acad. Sci.*, 104, 14266–14271.
- 24 **Becker, T. W.**, Browaeys, J. T.*, and Jordan, T. H. (2007): Stochastic analysis of shear-wave splitting heterogeneity length scales and the origin of seismic anisotropy. *Earth Planet. Sci. Lett.*, 259, 526–540.
- 23 Faccenna, C., Heuret, A., Funiciello, F., Lallemand, S., and **Becker, T. W.** (2007): Predicting trench and plate motion from the dynamics of a strong slab. *Earth Planet. Sci. Lett.*, 257, 29–36.
- 22 Kaus, B. J. P.* and **Becker, T. W.** (2007): Effects of elasticity on the Rayleigh-Taylor instability: implications for large-scale geodynamics. *Geophys. J. Int.*, 168, 843–862.
- 21 Montési, L. G. J., di Toro, G., Simons, F. J., Akber-Knudson, S., **Becker, T. W.**, Billen, M., Deschamps, A., and Kellogg, J. B. (2006): Young scientists focus on the dynamics of the lithosphere, *Eos Trans. AGU*, 87, 44, 482–483.
- 20 **Becker, T. W.** (2006): On the effect of temperature and strain-rate dependent viscosity on global mantle flow, net rotation, and plate-driving forces. *Geophys. J. Int.*, 167, 943–957.
- 19 **Becker, T. W.**, Chevrot, S., Schulte-Pelkum, V., and Blackman, D. K. (2006): Statistical properties of seismic anisotropy predicted by upper mantle geodynamic models. *J. Geophys. Res.*, 111, B08309, doi:10.1029/2005JB004095. (16 p.)
- 18 **Becker, T. W.**, Schulte-Pelkum, V., Blackman, D. K., Kellogg, J. B., and O'Connell, R. J. (2006): Mantle flow under the western United States from shear wave splitting, *Earth Planet. Sci. Lett.*, 247, 235–251.
- 17 Piromallo, C., **Becker, T. W.**, Funiciello, F., and Faccenna, C. (2006): Three-dimensional instantaneous mantle flow induced by subduction, *Geophys. Res. Lett.*, 33, L08304, doi:10.1029/2005GL025390. (4 p.)
- 16 Boschi, L., **Becker, T. W.**, Soldati, G., and Dziewonski, A. M. (2006): On the relevance of Born theory in global seismic tomography. *Geophys. Res. Lett.*, 33 L06302, doi:10.1029/2005GL025063. (4 p.)
- 15 Enns, A., **Becker, T. W.**, and Schmeling, H. (2005): The dynamics of subduction and trench migration for viscosity stratification. *Geophys. J. Int.*, 160, 761–775.
- 14 Simons, F. J., **Becker, T. W.**, Kellogg, J. B., Billen, M., Hardebeck, J., Lee, C.-T., Montési, L. G. J., Panero, W. and Zhong, S. (2005): MYRES: A Program to Unite Young Solid Earth Researchers, *Eos Trans. AGU*, 86, 5, 48–49.
- 13 **Becker, T. W.**, Hardebeck, J. L., and Anderson, G. (2005): Constraints on fault slip rates of the southern California plate boundary from GPS velocity and stress inversions. *Geophys. J. Int.*, 160, 634–650.
- 12 Simons, F. J., **Becker, T. W.**, Kellogg, J. B., Billen, M., Hardebeck, J., Lee, C.-T., Montési, L. G. J., Panero, W. and Zhong, S. (2004): *Young Solid Earth Researchers of the World Unite!*, *Eos Trans. AGU*, 85, 60, 160–161.
- 11 **Becker, T. W.**, Kellogg, J. B., Ekström, G., and O'Connell, R. J. (2003): Comparison of azimuthal seismic anisotropy from surface waves and finite-strain from global mantle-circulation models, *Geophys. J. Int.*, 155, 696–714.

- 10 Felzer, K. R., **Becker, T. W.**, Abercrombie, R. E., Ekström, G., and Rice, J. R. (2002): Triggering of 1999 Mw 7.1 Hector Mine earthquake by aftershocks of the 1992 Landers earthquake, *J. Geophys. Res.*, 107, 2190, doi:10.1029/2001JB000911. (13 p.)
- 9 **Becker, T. W.** and Boschi, L. (2002): A comparison of tomographic and geodynamic mantle models, *Geochem., Geophys., Geosys.*, 3(1), 1003, doi:10.1029/2001GC000168. (48 p.)
- 8 **Becker, T. W.** and O'Connell, R. J. (2001): Predicting plate velocities with mantle circulation models, *Geochem., Geophys., Geosys.*, 2(12), 1060, doi:10.1029/2001GC000171. (54 p.)
- 7 Faccenna, C., **Becker, T. W.**, Lucente, F. P., Jolivet, L., and Rossetti, F. (2001): History of subduction and back-arc extension in the central Mediterranean. *Geophys. J. Int.*, 145, 809–820.
- 6 **Becker, T. W.** (2000): Deterministic chaos in two state-variable friction sliders and the effect of elastic interactions, in *GeoComplexity and the Physics of Earthquakes*, edited by J. B. Rundle, D. L. Turcotte, and W. Klein, p. 5–26, AGU, Washington DC.
- 5 **Becker, T. W.**, Kellogg, J. B., and O'Connell, R. J. (1999): Thermal constraints on the survival of primitive blobs in the lower mantle. *Earth Planet. Sci. Lett.*, 171, 351–365.
- 4 **Becker, T. W.**, Faccenna, C., O'Connell, R. J., and Giardini, D. (1999): The development of slabs in the upper mantle: insights from experimental and laboratory experiments. *J. Geophys. Res.*, 104, 15,207–15,226.
- 3 **Becker, T. W.** and Braun, A. (1998): New program maps geoscientific data sets interactively. *Eos Trans. AGU*, 79(42), 505–506.
- 2 **Becker, T. W.** and Schmeling, H. (1998): Earthquake recurrence time variations with and without fault zone interactions. *Geophys. J. Int.*, 135, 165–176.
- 1 Dahm, T. and **Becker, T. W.** (1998): On the elastic and viscous properties of media containing strongly interacting in-plane cracks. *Pure Appl. Geophys.*, 151, 1 – 16.

- Manga, M. and **Becker, T. W.** (2017), Richard J. O’Connell (1941–2015), *Eos*, 98, doi:10.1029/2017EO086639.
- McGuire, J. J., T. Plank, et al. (2017): *The SZ4D Initiative: Understanding the Processes that Underlie Subduction Zone Hazards in 4D*. Vision Document Submitted to the National Science Foundation. The IRIS Consortium, 63 pp.
- Hanson, B., J. Lunn, B. van der Pluijm, J. Orcutt, R. Colwell, S. Trumbore, **T. W. Becker**, N. Dissenbaugh, R. Pincus, M. Liemohn, U. ten Brink, P. Brewer, M. Zhang, S. A. Hauck II, B. Hubbard, M. Goni, E. Thomas, P. Wilkinson, M. Moldwin, D. J. Knipp, J. Geissman, and M. Clark (2017): Earth and Space Science for the Benefit of Humanity, *Eos, Editor’s Vox*.
- **Becker, T. W.** (2015): *G-Cubed: Building on 15 years of publishing process-level science*, *Eos*, 96, doi:10.1029/2015EO031977.
- **Becker, T. W.** and Kaus, B. J. P. (2016): *Numerical Modeling of Earth Systems. An introduction to computational methods with focus on solid Earth applications of continuum mechanics*. v. 1.2, University of Southern California, Los Angeles (224 pages).
Available with Matlab exercises at <http://www-udc.ig.utexas.edu/external/becker/teaching-557.html>.
- **Becker, T. W.** (2002): *Lithosphere–Mantle Interactions*, Ph.D. thesis, Harvard University, Cambridge MA. (<http://www-udc.ig.utexas.edu/external/becker/thesis.tp.times10.pdf>)
- **Becker, T. W.** (1997): *Finite Elemente Modellierung zur Bruchaktivierung in Scherzonen*. M. Sc. thesis (in German), J.W.Goethe University, Frankfurt am Main.

INVITED PRESENTATIONS AND KEYNOTES DURING THE LAST THREE YEARS

- CEREGE, Aix-en-Provence, July 2018.
- Japanese Geoscience Union Meeting, Makuhari Messe, May 2018.
- Japan Agency for Marine-Earth Science and Technology, Yokosuka, May 2018.
- Workshop on *Convection in Nature*, Princeton Center for Theoretical Science, Princeton NJ, February 2018.
- AGU Fall Meeting, New Orleans, LA, December 2017.
- NetherMod Workshop on Mantle and Lithospheric Dynamics, Putten, Netherlands, August 2017.
- CIDER Summer School on *Subduction Dynamics*, Berkeley CA, June 2017.
- Research School of Earth Sciences, Australian National University, Canberra, June 2017.
- *Rodinia 2017 – Supercontinent Cycles and Global Geodynamics*, Townsville, Australia, June 2017.
- Department of Physics, The University of Louisiana at Lafayette, March 2017.
- Department of Geological Sciences, The University of Texas at Austin, March 2017.
- CIDER pre-AGU Workshop, Berkeley CA, December 2016.
- Università di Roma TRE, Rome, Italy, November 2016.
- Subduction Zone Observatory Workshop, Boise ID, September 2016.
- CIDER Summer School on *Flow in the Deep Earth*, Santa Barbara CA, July 2016.
- CIDER Community Workshop, Pt. Reyes CA, May 2016.
- 130 invited presentations between 1998 and 2015.

CONFERENCE CONTRIBUTIONS

- 10 in 2018, 30 in 2017, 24 in 2016.
- 377 between 1996 and 2015.

COMMUNITY SERVICE AND SELECTED SYNERGISTIC ACTIVITIES

- Scientific Editing:
 - Editor. *Earth and Space Science Open Archive*, 2018 –.
 - Editor. *Geochemistry, Geophysics, Geosystems (G³)*, 2018.
 - Editor in Chief. *Geochemistry, Geophysics, Geosystems (G³)*, 2009 – 2017.
 - Editor. *Geophysical Journal International*, 2004 – 2009.
- National Research Council, National Academy of Sciences, *Standing Committee on Seismology and Geodynamics*, 2015 – 2019.
- Proposal Evaluation Committees:
 - German Science Foundation (DFG), 2017.
 - National Science Foundation, 2005, 2010 – 2012.

- United States Geological Survey, *National Earthquake Hazards Reduction Program*, 2005 – 2007.
- Planning Committee, *Southern California Earthquake Center*. Working group co-leader:
 - *Stress and Deformation Over Time*, 2011 – 2015.
 - *Lithospheric Architecture and Dynamics*, 2009 – 2011.
- Nominating Committees:
 - Computational Infrastructure for Geodynamics, 2012.
 - Tectonophysics Section, American Geophysical Union, 2009 – 2010, 2014 – 2017.
- Conference and workshop organization and follow-up:
 - Member, Advisory Committee, *Computational Engineering and Science for Safety and Environmental Problems (COMPSAFE)*, 2018–2020.
 - Co-Chair, *Coupling of Tectonic and Surface Processes*, Boulder, April 2018.
 - Member, Organizing Committee, *Workshop on Coupling of Tectonic and Surface Processes*, Boulder CO, April 2018.
 - Member, Report Writing Committee, *The Subduction Zone Observatory Workshop*, 2016–17.
 - Report Reviewer, *Challenges and Opportunities for Research in Earth Surface and Interior*, NASA, 2016.
 - 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 Rheology Model*, Palm Springs CA, September 2015.
 - *Community Stress Model*, Palm Springs CA, September 2015.
 - *Community Stress Model*, Pomona CA, October 2014.
 - *Community Stress Model*, Menlo Park CA, May 2013.
 - *SCEC Community Stress Model*, Los Angeles CA, October 2012.
 - *Strategies for Implementing a SCEC Community Stress Model*, Palm Springs CA, September 2011.
 - 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, *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 for sessions at
 - *Coupling of Tectonic and Surface Processes*, Boulder, 2018.
 - *American Geophysical Union Fall Meeting*, New Orleans, 2017.
 - *Japanese Geoscience Union Meeting*, Makuhari, Japan, 2017.
 - *UNAVCO Science Meeting*, Broomfield CO, 2016.
 - *American Geophysical Union Fall Meeting*, San Francisco, 2015 (three sessions).
 - 23 special sessions organized before 2015.
- Outstanding student poster award (OSPA) judge: AGU 2008, 2012, 2014. EGU 2014.
- Mentor, AGU OSPA Union eLightning Presentation participants, 2017.
- Summer schools and international short courses:
 - Steering Committee, SCEC-ERI Tokyo Summer School on Earthquake Science, 2013 – 2015.
 - Advisory Committee, Cooperative Institute for Dynamic Earth Research (CIDER), 2013 – 2017.
 - CIDER Summer program 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):
 - Revised general education class *Introduction to Geology* (303, Spring 2017)
 - Created new undergrad/grad class *Introduction to Geodynamics* (371T/391, Fall 2017)
 - Created new undergrad class *Crises of a Planet* (with Gardner and Mohrig; 302P, Spring 2018)
 - 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)

- 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
- 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.*, *G-Cubed*, *Geophys. Res. Lett.*, *Phys. Earth Planet. Int.*, *Tectonophysics*, *Lithosphere*, *Pure Appl. Geophys.*, *J. Geodynam.*, and *Adv. Geophys.*.
- Proposal reviewer for the National Science Foundation (Geophysics, Tectonics, CSEDI, GeoPRISMS, MG&G, IES/CD, EarthScope, OCE, Geoinformatics, MRI, and CMG), IODP, Southern California Earthquake Center, United States Geological Survey, European Research Council, Natural Environment Research Council (UK), the German, Swiss, and Czech Science foundations, ETH Zurich Research Commission, Netherland's NWO, Austria's FWF, The Royal Society of New Zealand, The Marsden Fund, Agence National de

la Recherche (France), US-Civilian Research & Development Foundation, Cambridge University Press (books).

- The University of Texas at Austin
 - Jackson School of Geosciences
 - Member, Promotion and Appointments Committee (2016 –)
 - Institute for Geophysics
 - Member, Director Search Committee (2018 –)
 - Chair, Mentoring Committee (2016 –)
 - Member, Annual Performance Evaluation Committee (2018)
 - Chair, Technical Programmer Search Committee (2018)
 - Member, Seminar Committee (2016 –)
 - Member, HPCC Committee (2016 –)
 - Director's Circle of Excellence, 2016, 2017
 - Department of Geological Sciences
 - Executive Committee/Program Leader, *Lithosphere and Deep Earth* (2016 – 2018)
 - Chair, Structural Geology Chair search (2017 –)
 - Chair, Annual Evaluation Committee for LDE (2016 – 2018)
 - Member, Tenure Committee (2017)
 - Chair, Promotion Committee (2018)
 - Bureau of Economic Geology
 - Member, RA Seismologist Search Committee (2018)
- Department of Earth Science, University of Southern California, Los Angeles
 - Member, Tenure Committee (2014, 2015)
 - Member, Merit Review committee (2006, 2010, 2015)
 - Member, USC Earth Sciences delegation to fundraising event at Houston AAPG meeting, 2014
 - Member, Faculty Promotion Committee (2013)
 - Chair, Climate Initiative Committee (2012 – 2013)
 - Member of two Faculty Mentoring Committees (2011 – 2015)
 - Chair, Geophysics Search Committee (2006 – 2007)
 - Member, Search Committee for
 - Geophysics (2013 – 2014)
 - Lithospheric Dynamics (2011 – 2012)
 - Climate Dynamics (2009 – 2010)
 - Geophysics (2007 – 2008)
 - Member, Dean's *College 2020* proposal evaluation panel (2009, 2011)
 - Chair, Computing Committee (2008 – 2016).
 - Undergraduate program adviser (2009)
 - Member, Chair Search Advisory Committee (2006)
 - Representative at *UNAVCO* (2006 – 2016)
 - Member, Computing Committee (2004 – 2008)
 - Representative at the *Computational Infrastructure for Geodynamics* (2004 – 2016)

- Summer undergraduate interns:
 - Dorothy Linnemann (2017, Scripps College, with Lavier); Fabienne Stockmann (2014, Münster University); Simon Schneider (2013, Münster University); Kevin Milner³⁷ (2008, USC); Jared Sain³⁷ (2008, USC); Hannah Waterhouse³⁷ (2008, Bryn Mawr College); Katrin Plenkens (2005, Karlsruhe)
- Undergraduate advisees:
 - Zel Hurewitz (2017–, UT Austin, physics)
 - Bradford Foley⁴³ (BSc 2008; Assistant Professor, Penn State)
- MSc students:
 - Zi-Yu Wu (MSc 2010; Guosen Securities)
 - Clare Steedman³⁴ (MSc 2006; Iris Environmental)
- PhD students:
 - directly supervised:
 - current: Kunpeng Liao (2016–), Wanying Wang (2016–).
 - Adam Holt^{89,91,92,94,107-109,115,117} (PhD 2016; post-doc, MIT)
 - Michael Kaplan (PhD 2015; medical school)
 - Mélanie Gérault⁶⁴ (PhD 2014; post-doc, ENS Lyon)
 - Thomas Goebel^{63, 71, 77, 79, 82, 113} (PhD 2013; post-doc, UCSC)
 - Lisa Alpert^{53,65,75} (PhD 2012; Aera Energy Llc.)
 - Iain Bailey^{40,49,53,65} (PhD 2009; Swiss Re)
 - Committee member: Chang Lu (2018–), Brandon Schuck (2018–), Chujie Liu (2017–), Lily R. Serach (external chair, 2017–), Brooklyn Gose (2017–), Peter Nelson (2017–), Jessica Stellman⁹⁵ (2014–), William Schmidt (2015–2016), Xinjiang Xiang (2015), Xin Song (2014–2015), Xin Liu (2014–2015), Beth Paulson (2014–2016), 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), Jeremy Zechar (PhD 2008).
 - External reviewer: Angela Maria Gomez Garcia (U Medellin, 2016), Juliane Dannberg (GFZ Potsdam, 2016), Raquibul Hassan (U Sydney, 2016), Rene Gasmöller (GFZ Potsdam, 2014), Sabin Zahirovic (U Sydney, 2014).
- Member of the Board, International Graduate School, Department of Earth Sciences, Università di Roma TRE, 2014–.
- Post-docs:
 - current: Lukas Fuchs (2016–), Matt Weller (2016–), and Rob Porritt (2017–).
 - Attreyee Ghosh^{44,70} (2008 – 2010; Assistant Professor, Indian Institute of Science, Bangalore)
 - Boris Kaus^{22,33-35,42,64} (2005 – 2006; Professor, Mainz University)
 - Jules Browaeys²⁴ (2006; Geophysicist, Total E&P Norge AS)

PROFESSIONAL AFFILIATIONS

- American Geophysical Union
- European Geoscience Union
- Japanese Geoscience Union
- Deutsche Geophysikalische Gesellschaft

CLASSES TAUGHT

- *Sustaining a Planet* (UT GEOL 301P): S18
General education undergraduate class on all aspects of natural hazards.
- *Introduction to Geodynamics* (UT GEOL 371T/391): F17
Introduction to mantle and lithospheric geodynamics for undergraduate majors and grad students.
- *Introduction to Geology* (UT GEOL303): 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
Advanced graduate class on PDE and ODE solution methods with extensive programming exercises focusing on finite difference and element methods.
- *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 ductile 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 Università 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 Università 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:
 - *Collaborative Research: Multi-scale models of subduction zone earthquake cycle observations.* NSF, EAR-1722680, \$233,467. PI, co-PIs L. Lavier and A. Freed (Purdue). 07/2017 – 06/2019.
 - *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.
 - *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.

- *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 – 05/2019.
- *Collaborative Research: Shear-wave splitting and mantle dynamics of the North American plate*
NSF-EarthScope, EAR-1460479, \$150,516 (UT component). Co-PI, with K. Liu (PI). 07/2015 – 06/2018.

– Past support:

- *Earth-Life Transitions: Linked geochemical/biotic response to massive volcanic CO₂ 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*
NSF–Geophysics, EAR-0509722, \$212,829. PI. 07/2005 – 12/2008.
 - *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. 02/2008 – 01/2009.
 - *Continued Analysis of Small-scale Strain Patterns Associated with Southern California Earthquakes*
NSF/USGS–SCEC, \$21,000. PI. 02/2007 – 01/2008.
 - *A 3-D Visco-plastic Model of Instantaneous Lithospheric Deformation in Southern California*
NSF/USGS–SCEC, \$30,000. PI. 02/2007 – 01/2008.
 - *Continued Analysis of Spatio-Temporal Strain Patterns Associated with Southern California Earthquakes*
NSF/USGS–SCEC, \$20,000. PI. 02/2006 – 01/2007.
 - *Toward a Comprehensive Model of Mantle Flow and Seismic Anisotropy in the Western U.S.: Using Mineral Physics to Directly link Geodynamics and Seismology*
NSF–Collaborative Study of Earth’s Deep Interior, \$56,940. Co-PI, with D. Blackman. 10/2004 – 09/2006.
 - *Analysis of Spatio-Temporal Strain Patterns Associated with Southern California Earthquakes*
NSF/USGS–SCEC, \$20,000. PI. 02/2005 – 01/2006.
 - *Meeting of Young Researchers in the Earth Sciences MYRES: A Conference Series and Community Development Initiative*
NSF-EAR, \$63,180. PI. 2004 – 2006.
 - Ph. D. Scholarship of the German Academic Exchange Service. PI. 1998 – 2001.