

# CURRICULUM VITAE

**Vera Schulte-Pelkum**

CIRES and Department of Geological Sciences

University of Colorado Boulder

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March 2024

## PROFESSIONAL PREPARATION

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Postdoc, CIRES, University of Colorado Boulder, 2002-2003

Postdoc, University of California San Diego, Scripps Institution of Oceanography, 2001-2002

Ph.D., Geosciences, University of California San Diego, Scripps Inst. of Oceanography, 2001

M. Sc. (Diplom), *summa cum laude*, Geophysik, Ruhr-Universität Bochum, Germany, 1994

B. Sc. (Vordiplom), Geophysik, Ruhr-Universität Bochum, Germany, 1992

## ACADEMIC APPOINTMENTS

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2019 - Present                      **Associate Research Professor**, Dept. Geol. Sci., CU Boulder

2018 - Present                      **Research Scientist III**, CIRES, CU Boulder

2020 – 2022                        **Lecturer**, Department of Geological Sciences, CU Boulder

2004 - 2018                        **Research Scientist II**, CIRES, CU Boulder

2014 – 2015                        **Lecturer**, Dept. of Geological Sciences, CU Boulder

2013                                 **Research Scientist**, SUNY Binghamton

2003 – 2004                        **Research Scientist I**, CIRES, CU Boulder

## HONORS AND AWARDS

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2017                      Elected to Board of Directors, Incorporated Research Institutions for Seismology

2017                      Geophysical Journal International outstanding reviewer award

2011                      American Geophysical Union Editor's citation for excellence in refereeing

- 2011 Geophysical Journal International outstanding reviewer award
- 2003 CIRES innovative research program award
- 2002-2004 CIRES Visiting Fellow postdoctoral fellowship
- 2001 American Geophysical Union outstanding student presentation award
- 1994-1995 Studienstiftung Fellowship  
German Academic Scholarship Foundation 1-year overseas research fellowship
- 1994 Best Diplom (M.Sc.) thesis of the year, Ruhr-Universität Bochum, Germany
- 1991-1994 Studienstiftung Scholarship  
Studienstiftung (German Academic Scholarship Foundation) funds top ~0.5% university students in Germany

## PUBLICATIONS

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### *PEER-REVIEWED PUBLICATIONS*

(h-index: 22, Web of Science, March 2024; \*student collaborator)

**Schulte-Pelkum, V., M. Haney (2024)**, Fault-dike-magma interactions inferred from transcrustal conical structures under Akutan volcano, *Seismological Research Letters*, Focus section on volcano monitoring in the Americas, submitted.

**Schulte-Pelkum, V., Adrian Bender, Natalia A Ruppert.** Seismicity and Anisotropic Imaging Reveal an Active Detachment Beneath the Northern Alaska Range Foothills, in press, AGU Monograph Tectonics of Alaska and Western Canada. ESS Open Archive. September 30, 2023, doi: 10.22541/essoar.169603563.33488782/v1

\*Frothingham, M.G., Mahan, K.H., **Schulte-Pelkum, V.**, Goncalves, P., and Zucali, M. (2023), Confronting solid-state shear bias: Magmatic fabric contribution to crustal seismic anisotropy. *Geophysical Research Letters*, <http://dx.doi.org/10.1029/2022GL102399>.

\*Sui, S., W. Shen, K. Mahan, V. **Schulte-Pelkum** (2022), Constraining the crustal composition of the continental U.S. using seismic observables, *Geological Society of America Bulletin*, doi:10.1130/B36229.1.

\*Frothingham, M., V. **Schulte-Pelkum**, K. Mahan, A. Merschat, M. \*Mather, Z. \*Cabrera Gomez (2022), Don't judge an orogen by its cover: Kinematics of the Appalachian Décollement from seismic anisotropy, *Geology*, 50(11), 1306-1311, doi:10.1130/G50323.1.

- \*Wu, S., P. Tong, C. Jiang, V. **Schulte-Pelkum** (2022), Complex patterns of past and ongoing crustal deformations in Southern California revealed by seismic azimuthal anisotropy, *Geophysical Research Letters*, 49(15), e2022GL100233, doi:10.1029/2022GL100233.
- \*Frothingham, M., K. Mahan, V. **Schulte-Pelkum**, J. S. Caine (2022), From crystals to crustal-scale seismic anisotropy: Bridging the gap between rocks and seismic studies with digital geologic map data in Colorado, *Tectonics*, 41, e2021TC006893, doi:10.1029/2021TC006893.
- \*Zhang, P., Meghan S. Miller and V. **Schulte-Pelkum** (2022), Tectonic fabric in the Banda arc-Australian continent collisional zone imaged by teleseismic receiver functions, *G-Cubed*, GGGE22772, doi:10.1029/2021GC010262.
- Schulte-Pelkum**, V., Thorsten W. Becker, Whitney Behr. Meghan S. Miller (2021), Tectonic inheritance during plate boundary evolution in southern California constrained from seismic anisotropy, *G-Cubed* 22(11), e2021GC010099, doi:10.1029/2021GC010099.
- R. Bernard, **Schulte-Pelkum**, V., W. M. Behr (2021), The competing effects of olivine and orthopyroxene CPO on seismic anisotropy, *Tectonophysics*, 814, 228954, doi:10.1016/j.tecto.2021.228954.
- Schulte-Pelkum**, V., J. S. Caine, J. V. Jones III, T. W. B. Becker (2020), Imaging the tectonic grain of the Northern Cordillera orogen using Transportable Array receiver functions, *Seismological Research Letters*, Focus section on EarthScope in Alaska and Canada, 91(6), 3086-3105, doi:10.1785/0220200182.
- Schulte-Pelkum**, V., Z. Ross, K. Mueller, Y. Ben-Zion (2020), Tectonic inheritance with dipping faults and deformation fabric in the brittle and ductile southern California crust, *Journal of Geophysical Research*, 125(8), e2020JB019525. doi:10.1029/2020JB019525.
- \*Berg, E., Fan-Chi Lin, A. Allam, V. **Schulte-Pelkum**, K. Ward, W. Shen (2020), Shear velocity model of Alaska via joint inversion of Rayleigh wave ellipticity, phase velocities, and receiver functions across the Alaska Transportable Array. *Journal of Geophysical Research*, 125(2), doi:10.1029/2019JB018582.
- Wang, K., Jiang, C., Yang, Y., **Schulte-Pelkum**, V., & Liu, Q. (2020). Crustal deformation in Southern California constrained by radial anisotropy from ambient noise adjoint tomography. *Geophysical Research Letters*, 47, e2020GL088580, doi:10.1029/2020GL088580.
- Monsalve, G. J. Jaramillo, A. C. Molina, V. **Schulte-Pelkum**, G. Posada, V. Valencia, E. Poveda (2019). Deep crustal faults, shear zones and magmatism in the Eastern Cordillera of Colombia: Growth of a plateau from teleseismic receiver function and geochemical Mio-Pliocene volcanism constraints. *Journal of Geophysical Research*, doi:10.1029/2019JB017835.

- Schulte-Pelkum, V.**, G. Monsalve, A. F. Sheehan, P. Shearer, F. Wu, S. Rajaure (2019). Mantle earthquakes in the Himalayan collision zone. *Geology*, 47(9), 815–819, doi:10.1130/G46378.1.
- \*Gal., M., A. Reading, N Rawlinson, V. **Schulte-Pelkum** (2018), Matched field processing of 3 component seismic array data applied to Rayleigh and Love microseisms. *Journal of Geophysical Research*, doi: 10.1029/2018JB015526.
- Brownlee, S. J., V. **Schulte-Pelkum**, A. \*Raju, K. Mahan, C. Condit, O. F. \*Orlandini (2017). Characteristics of deep crustal seismic anisotropy from a compilation of rock elasticity tensors and their expression in receiver functions. *Tectonics*, 36, 1835–1857, doi:10.1002/2017TC004625. (Eos highlight)
- Schulte-Pelkum, V.**, K. H. Mahan, W. Shen, J. C. Stachnik (2017). The distribution and composition of high-velocity lower crust across the continental U.S.: Comparison of seismic and xenolith data and implications for lithospheric dynamics and history. *Tectonics*, 36, 1455–1496, doi:10.1002/2017TC004480. (Editor's highlight)
- Allam, A. A., V. **Schulte-Pelkum**, Y. Ben-Zion, C. Tape, N. Ruppert, Z. E. Ross (2017). Ten kilometer vertical Moho offset and shallow velocity contrast along the Denali fault zone from double-difference tomography, receiver functions, and fault zone head waves. *Tectonophysics*, 721, 56-69, doi:10.1016/j.tecto.2017.09.003.
- McNamara, D.E., W. Yeck, W. Barnhart, V. **Schulte-Pelkum**, E. Bergman, L. B. Adhikari, A. Dixit, S. Hough, H. Benz, P. Earle (2016). Source Modeling of the 2015 Mw 7.8 Nepal (Gorkha) Earthquake Sequence: Implications for Geodynamics and Earthquake Hazards. *Tectonophysics*, 714-715, 21-30, doi:10.1016/j.tecto.2016.08.004.
- Schulte-Pelkum, V.**, K. H. Mahan (2014). Imaging faults and shear zones using receiver functions. *Pure Appl. Geophys.*, 171, 2967–2991, doi: 10.1007/s00024-014-0853-4.
- Levandowski, W., C. Jones, W. Shen, M. H. Ritzwoller, V. **Schulte-Pelkum** (2014). Mapping crustal and upper mantle density variations using a uniform seismic velocity model. *J. Geophys. Res.*, 119, 2375-2396, doi: 10.1002/2013JB010607.
- Schulte-Pelkum, V.**, K. H. Mahan (2014). A method for mapping crustal deformation and anisotropy with receiver functions and first results from USArray. *Earth Planet. Sci. Lett.*, 402, 221-233, doi:10.1016/j.epsl.2014.01.050.
- \*Yeck, W., A. F. Sheehan, V. **Schulte-Pelkum** (2013). Sequential H-kappa Stacking to Obtain Accurate Crustal Thicknesses beneath Sedimentary Basins. *Bulletin of the Seismological Society of America*, 103, 2142-2150, doi:10.1785/0120120290.
- \*Shen, W., M.H. Ritzwoller, V. **Schulte-Pelkum** (2013). Crustal and uppermost mantle structure in the central US encompassing the Midcontinent Rift. *J. Geophys. Res.*, 118, 4325-4344, doi:10.1002/jgrb.50321.

- \*Shen, W., M. H. Ritzwoller, V. **Schulte-Pelkum** (2013). A 3-D model of the crust and uppermost mantle beneath the Central and Western US by joint inversion of receiver functions and surface wave dispersion. *Journ. Geophys. Res.*, 118(1), 262-276, doi:10.1029/2012JB009602.
- \*Shen, W., M. H. Ritzwoller, V. **Schulte-Pelkum** (2013). Joint inversion of surface wave dispersion and receiver functions: A Bayesian Monte-Carlo approach. *Geophys. Journ. Int.*, 192(2), 807-836, doi:10.1093/gji/ggs050.
- Schulte-Pelkum**, V., Y. Ben-Zion (2012). Apparent vertical Moho offsets under continental strike-slip faults from lithology contrasts in the seismogenic crust. *Bulletin of the Seismological Society of America*, 102(6), 2757-2763, doi:10.1785/0120120139.
- Mahan, K., V. **Schulte-Pelkum**, T. J. Blackburn, S. A. Bowring, F. O. Dudas (2012). Seismic structure and lithospheric rheology from deep crustal xenoliths, central Montana, USA. *Geochem. Geophys. Geosystems*, 13(10), Q10012, doi:10.1029/2012GC004332.
- \*Ward, D., K. Mahan, V. **Schulte-Pelkum** (2012). Roles of quartz and mica in seismic anisotropy of mylonites. *Geophys. J. Int.*, 190(2), 1123-1134, doi:10.1111/j.1365-246X.2012.05528.x.
- van Wijk, K., T. D. Mikesell, V. **Schulte-Pelkum**, J. Stachnik (2011). Estimating the Rayleigh-wave impulse response between seismic stations with the cross terms of the Green tensor. *Geophys. Res. Lett.*, 38, L16301, doi: 10.1029/2011gl047442.
- Schulte-Pelkum**, V., G. P. Biasi, A. Sheehan, C. H. Jones (2011). Differential motion between surface and lithospheric mantle in the Central Basin and Range. *Nature Geoscience*, 4, 619-623, doi:10.1038/ngeo1229.
- Schulte-Pelkum**, V. (2009). Tectonics: Draining Nevada. News and Views, *Nature Geoscience*, 2, 381-382, doi:10.1038/ngeo532.
- Becker, T.W., V. **Schulte-Pelkum**, D.K. Blackman, J. B. Kellogg, R. J. O'Connell (2006). Mantle flow under the western United States from shear wave splitting. *Earth Planet. Sci. Lett.*, 247, 235-251, doi:10.1016/j.epsl.2006.05.010.
- Becker, T.W., S. Chevrot, V. **Schulte-Pelkum**, D. K. Blackman (2006). Statistical properties of seismic anisotropy predicted by upper mantle geodynamic models. *J. Geophys. Res.*, 111, B08309, doi:10.1029/2005JB004095.
- \*Monsalve, G., A. Sheehan, V. **Schulte-Pelkum**, S. Rajaure, F. Wu (2006). Seismicity and one-dimensional velocity structure of the Himalayan collision zone: Earthquakes in the crust and upper mantle. *J. Geophys. Res.*, 111, B10301, doi:10.1029/2005JB004062.
- Schulte-Pelkum**, V., G. Monsalve, A. Sheehan, M. Pandey, S. Sapkota, R. Bilham, F. Wu (2005). Imaging the Indian Subcontinent beneath the Himalaya. *Nature*, 435, 1222-1225, doi: 10.1038/nature03678.

Sheehan, A., V. **Schulte-Pelkum**, O. Boyd, C. Wilson (2005). Passive Source Seismology of the Rocky Mountain Region. In: *The Rocky Mountain Region: An Evolving Lithosphere - Tectonics, Geochemistry, and Geophysics* (eds. K. E. Karlstrom, G. R. Keller), American Geophysical Union, Washington, D. C., doi: 10.1029/154GM23.

**Schulte-Pelkum**, V., P. S. Earle and F. L. Vernon (2004). Strong directivity of ocean-generated seismic noise. *G-Cubed*, 5, Q03004, doi:10.1029/2003GC000520.

**Schulte-Pelkum**, V., F. L. Vernon, J. Eakins (2003). Large teleseismic P wavefront deflections observed with broadband arrays. *Bull. Seis. Soc. Am.*, 93, 747-756, doi:10.1029/2003GC000520.

**Schulte-Pelkum**, V., D. K. Blackman (2003). A synthesis of seismic P and S anisotropy. *Geophys. J. Int.*, 154, 166-178, doi: 10.1046/j.1365-246X.2003.01951.x.

**Schulte-Pelkum**, V., G. Masters, P. M. Shearer (2001). Upper mantle anisotropy from long-period P polarization. *J. Geophys. Res.*, 106, 21,917-21,934, doi:10.1029/2001JB000346.

### ***THESES***

Mantle structure and anisotropy from the particle motion and slowness of compressional body waves, Ph.D. thesis, Scripps Institution of Oceanography, 2001.

Multiparameter inversion of elastic scattering, M.Sc. thesis (*summa cum laude*), Ruhr-Universität Bochum, 1994.

## **FUNDING**

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### **Active awards**

NSF Geophysics

Title: Volcanic transcrustal magmatic systems imaged with teleseismic converted phases

Principal Investigators: V. Schulte-Pelkum, M. Haney (Alaska Volcano Observatory)

Period: 2021-2024

Amount: \$115,158.

NSF Geoinformatics

Title: Collaborative research: Implementation of Tensor Visualization guide (TVguide), an interactive visualization, analysis and database tool for seismic anisotropy

Principal Investigators: V. Schulte-Pelkum, S. Brownlee (Wayne State U)

Period: 2020-2024

Amount: \$79,387.

NSF Geophysics

Title: Collaborative research: Structure and depth extent of lithospheric shear zones surrounding continental transform faults

Principal Investigators: V. Schulte-Pelkum, T Becker (U Texas Austin)  
 Period: 2019-2024  
 Amount: \$135,052.

### **Past awards (CU PI on all grants)**

- NSF EarthScope/EarthCube, Building a continent: Integration of surface geology, rock physics, and seismic observations to investigate the tectonic history of the contiguous United States, 2017-2020, \$284,196.
- NSF Geophysics, Collaborative research: A joint seismic and geodetic investigation into the structure and behavior of an intracontinental subduction zone, Nepal, 2017-2019, \$77,278.
- Southern California Earthquake Center, High-resolution cross- and sub-fault comparisons of CFM, seismicity, and structural fabric imaged with receiver functions, 2020-2021, \$20,6932.
- Southern California Earthquake Center, Synthesis of fault geometry, seismicity, and deep structural fabric to constrain Community Fault (CFM) and Rheology (CRM) Models, 2021-2022, \$19,500.
- Southern California Earthquake Center, Improving near surface crustal model across southern California by jointly inverting Rayleigh wave phase velocity/ellipticity and receiver functions, 2020-2021, \$11,602.
- Southern California Earthquake Center, Improved lithospheric structure and Moho across Southern California from joint inversion of broadband Rayleigh wave ellipticity/phase dispersion and harmonic receiver functions, 2019-2020, \$10,995.
- Southern California Earthquake Center, Interpreting crustal and lithospheric structure in the Eastern California Shear Zone underneath the Mojave Broadband Array, 2019-2020, \$8,000.
- U.S. Geological Survey National Earthquake Hazard Program, Determination of near-surface shear velocity and  $V_s$ ,  $V_p$ , and thickness of unconsolidated sediments using high-frequency teleseismic receiver functions across the U.S., 2018-2019, \$49,777.
- Southern California Earthquake Center, Testing the effect of anisotropic rheology on lithospheric deformation in Southern California, 2018-2019, \$8,000.
- Southern California Earthquake Center, Deep Fault Structure Beneath the Mojave from a High Density, Passive Seismic Profile, 2017-2018, \$8,000.
- NSF Geophysics, The role of hot crust in mountain building: Testing the alpha-beta quartz transition as a crustal geothermometer, 2014-2018, \$84,433.
- NSF Geophysics/Office of International Science and Engineering, Is continental collision thick- or thin-skinned? Combining local seismicity with receiver functions in the Zagros Fold-and-Thrust Belt (PI), 2013-2018, \$184,579.
- Southern California Earthquake Center, Imaging ductile fault roots with deep crustal anisotropy: Implications for the distribution of lithospheric deformation in Southern California, 2017-2018, \$20,000.
- NSF EarthScope, Crustal deformation across the U.S. from harmonic analysis of receiver functions (PI), 2013-2017, \$184,873.
- NSF Geophysics, Collaborative Research: Dynamics of the Southern Rocky Mountains from Cross-term Estimates of the Seismic Green Tensor (Co-PI), 2012-2016, \$64,161.
- NSF EarthScope, Lowrider: The Where, When, and How of Continental Crustal Underplating (PI), 2011-2015, \$95,077.
- NSF Tectonics, Collaborative Research: An Exhumed Field Example of Heterogeneous Lower Crustal Flow, Athabasca Granulite terrane, Canada (Co-PI), 2010-2014, \$224,275.

- NSF Geophysics, Collaborative Research: High-resolution receiver function imaging of crustal structure in the Southern Great Basin, Nevada (PI), 2009-2012, \$75,564.
- NSF Geophysics, Himalayan Seismotectonics and Deep Structure (PI), 2006-2011, \$194,100.
- NSF SGER, Integrated Petrophysical and Seismological Investigation of Crustal Fabric and Seismic Anisotropy of a Major Crustal Suture Zone, the Cheyenne Belt, Wyoming (PI), 2007-2010, \$75,000.
- NSF CSEDI, Collaborative Research: Toward a Comprehensive Model of Mantle Flow & Seismic Anisotropy in the Western US - Using Mineral Physics to Directly Link Geodynamics & Seismology (Co-PI), 2004-2008, \$105,604.
- NSF Geophysics, Depth Resolution of Anisotropy using Body Waves (PI), 2003-2007, \$99,181.
- CIRES Innovative Research Program, Can directional seismic noise be used to hindcast ocean waves? (PI), 2003, \$23,060.

## INVITED SEMINAR TALKS

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- Inherited structure in the lithosphere and its interaction with deformation, faulting, and seismicity. University of Southern California Earthquake Seminar, Los Angeles, CA, April 4, 2023.
- Transcrustal magmatic fabrics under Alaska volcanoes from harmonic receiver functions. Alaska EarthScope workshop, Nanaimo, B.C., Canada, April 25, 2022.
- Imaging Northern Cordillera lithosphere tectonic fabric and oriented transcrustal magmatic arc structures with receiver functions. Alaska EarthScope and Beyond, virtual seminar series hosted by UC Davis and Michigan State University, February 1, 2021.
- Controls on deformation from reactivation of inherited rock fabric and shear zones in response to a changed stress regime: Examples from Southern California. University of Texas at Austin, UTIG seminar, Austin, TX, April 27, 2018.
- Subsurface deformation in the crust and lithosphere from seismology and rock properties. University of Florida, Department of Geological Sciences seminar, Gainesville, FL, November 14, 2017.
- Deciphering continental deformation history using seismic data. University of Utah, Department of Geology and Geophysics Distinguished Lecture Series, Salt Lake City, UT, November 12, 2015.
- The seismic signature of the deformation history of continents. Scripps Institution of Oceanography Geophysics seminar, University of California, San Diego, CA, October 9, 2015.
- Reading the signature of continental deformation and collision in the Earth's crust. University of New Mexico geophysics seminar, Albuquerque, NM, April 17, 2015.
- Reading lithospheric deformation history recorded by petrofabrics using dip and anisotropic tilt in seismic data. University of Southern California geophysics seminar, Los Angeles, CA, November 18, 2014.
- Crustal seismic anisotropy, geological ground truth from the Canadian Shield, and application to Taiwan. National Taiwan University Geophysics seminar, Taipei, Taiwan, November 15, 2013.



- Constraints on crustal deformation and mantle dynamics using new approaches for receiver functions. Workshop on Seismology and Geodynamics, Academia Sinica, Taipei, Taiwan, November 11, 2013.
- Waiter, there's an eclogite in my jelly sandwich. Colorado State University Geophysics seminar, Fort Collins, CO, March 26, 2012.
- Waiter, there's an eclogite in my jelly sandwich. Stanford Geophysics seminar, Stanford, CA, March 8, 2012.
- Constraints on crustal and mantle deformation in the western U.S. from new approaches using receiver functions and surface waves, University of Southern California, October 14, 2011.
- From seismic measurements to anisotropy: Cartoons versus the Grand Unified Theory of mantle dynamics. Gordon conference on Interior of the Earth, Mount Holyoke College, MA, June 10, 2003.

## SELECTED CONFERENCE PRESENTATIONS

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### 2023

- S. Brownlee, V. Schulte-Pelkum, TVguide: Tensor Visualization Made Easy and Accessible, Fall AGU.
- Schulte-Pelkum, V., D. Kilb, W. Shinevar, Lithospheric Removal and Moho Modification in Active Orogens: Examples from the Sierra Nevada and Tibetan Plateau, Fall AGU.
- Schulte-Pelkum, V., M. Haney, Transcrustal Magmatic Oriented Structures at Aleutian and Alaskan Volcanoes from Receiver Function Anisotropic Contrasts, Fall AGU.

### 2022

- Li, S., V. Schulte-Pelkum, W. Barnhart, and M. Karplus, Mechanical anisotropy of the Main Himalayan Thrust from geodetic modeling and seismic imaging, Fall AGU.
- Schulte-Pelkum, V., N. Ruppert, A. Bender, Structure of an active detachment under the Kantishna Hills anticline near the Denali Fault/Northern Alaska Range Foothills thrust system from seismicity and receiver function anisotropy, Fall AGU.
- Kilb, D. and V. Schulte-Pelkum, Deep crustal deformation from the Central San Andreas fault through the Sierra Nevada from seismicity and anisotropic receiver functions, Fall AGU.
- (Invited)* Schulte-Pelkum, V., M. Frothingham, T. Becker, K. Mahan, J.S. Caine, Structural inheritance in the lithosphere from seismic imaging, Geological Society of America annual meeting.
- Schulte-Pelkum, V., & Kilb, D. (2022). Deep lower crustal seismicity and fabric in the Sierra Nevada: Implications for the fossil slab versus delamination debate, SCEC Annual Meeting.
- (Invited)* Schulte-Pelkum, V., Hanxiao Wu, and Weisen Shen, Seasonal and long-term variations in seismic records in polar regions, talk at workshop on the Future of Geodetic-Geophysical Observational Networks in Antarctica, Fort Collins, CO, September 2022.
- (Invited)* Schulte-Pelkum, V., Transcrustal magmatic fabrics under Alaska volcanoes from harmonic receiver functions, EarthScope Alaska Synthesis and EON-ROSE workshop, Nanaimo, BC, Canada, April 2022.

### 2021

- (Invited)* Schulte-Pelkum, V., V. Tsai, L. Wallace, W. M. Behr, R. Burgmann, M. Cooke, Great Unsolved Questions in Tectonophysics: How do Lithospheric Layers and Asthenosphere Interact, and What are Their Rheological Properties as a Function of Depth? Fall AGU, T34B-01.

- Schulte-Pelkum, V., M. Haney, Imaging of Transcrustal Magmatic Oriented Structures and Fabric at Alaskan Volcanoes Using Receiver Function and Surface Wave Anisotropy. Fall AGU, V11C-04.
- Kilb, D., V. Schulte-Pelkum, T. W. Becker, W. M. Behr, M. S. Miller, Past and Present Deformation along the San Andreas from Microseismicity, Geodesy, and Seismological Constraints, Fall AGU, T52C-08.
- Link, F., V. Schulte-Pelkum, T. W. Becker, Constraints on Plate Boundary Mechanics from a Comparison of Mantle and Crustal Anisotropy at Continental Transform Faults. Fall AGU, T52C-04.
- M. Frothingham, V. Schulte-Pelkum, K. Mahan, A. Merschat, M. Mather, Z. Cabrera Gomez, East-dipping seismically anisotropic foliation above the Appalachian décollement inferred from azimuthally varying Ps receiver functions at SESAME stations in the Blue Ridge and Piedmont terranes: Implications for Alleghanian deformation patterns in the Appalachian Orogen, U.S.A. Fall AGU, T31A-02.
- Liu, T., V. Schulte-Pelkum, P. Shearer, Accumulation of partial melt beneath the Cascadia forearc constrained by teleseismic S reflections and P receiver functions. Fall AGU, D115C-0025.
- Schulte-Pelkum, V., D. Kilb, Synthesis of fault geometry, seismicity, and deep structural fabric to constrain Community Fault (CFM) and Rheology (CRM) Models, Southern California Earthquake Center annual meeting, abstract 113.
- Becker, T., V. Schulte-Pelkum, W. Behr, M. Miller, Tectonic inheritance during plate boundary evolution in southern California constrained from seismic anisotropy, Southern California Earthquake Center annual meeting, abstract 006.

## 2020

- (Invited)* Schulte-Pelkum, V., S. Brownlee. Lowering the Access Threshold to 3-dimensional Visualization and Programming Benchmarks via an Interactive Web Tool: Tensor Visualization Guide (TVguide) for Elasticity Tensor and Seismic Anisotropy Analysis. Fall AGU, ED11-01.
- Schulte-Pelkum, V., A. Ross, K. Mueller, Y. Ben-Zion, Inherited tectonic grain in southern California inferred from receiver functions and seismicity and possible effects on present-day deformation. Fall AGU, T032-02.
- Caine, J. S., V. Schulte-Pelkum, T. W. Becker, J. V. Jones, Continuity Between Surface and Deep Lithospheric Deformational Grain for the Northern Cordillera Using Transportable Array Receiver Functions. Fall AGU, T0350-06.
- Schulte-Pelkum, V., S. Li, B. Barnhart, M. Karplus, Anisotropic strength of fault zones suggested from geodesy and seismic imaging: Example from the Main Himalayan Thrust. SCEC annual meeting abstract 128.

## 2019

- (Invited)* Schulte-Pelkum, V., Monsalve, G., Orlandini, O.F., Condit, C., Sheehan, A., Shearer, P., Mahan, K., Wu, F., Rajaure, S. Seismic observations of processes in collisional continental lithosphere: Rheological changes, phase changes, and deformation. Fall AGU.
- (Invited)* Schulte-Pelkum V, Monsalve G, Li S, Barnhart W, Sheehan A, Shearer P, Wu F, Rajaure S. "(invited) Deep Structure of the Main Himalayan Thrust and Indian Mantle From Structural Imaging, Geodetic Modeling, and Seismicity. Fall AGU.

## 2018

- (Invited)* Schulte-Pelkum, V., K. H. Mahan, C. Condit, W. Shen, J. Stachnik. Mapping modification of deep crustal structure in the Wyoming province using xenoliths, crystalline basement exposures, and receiver functions. Fall AGU.

- Schulte-Pelkum, V., E. Karasozen, E. Bergman, K. Motaghi, A. Ghods. Thick- versus thin-skinned tectonics in the continental collision zone of the Zagros Fold-and-Thrust Belt from crustal delay time imaging with seismicity and receiver functions. Fall AGU.
- Schulte-Pelkum, V., Z. Ross, K. Mueller, Y. Ben-Zion. Dipping fault structures near the brittle-ductile transition and deep foliation fabric in southern California, SCEC annual meeting, Palm Springs, CA.
- Schulte-Pelkum, V., G. Monsalve, K. Mahan, O. Orlandini, C. Condit, A. Sheehan, P. Shearer. Structural, seismicity, and thermal mapping with receiver functions, IRIS workshop, June 12-14, Albuquerque, NM.
- 2017**
- Schulte-Pelkum, V., W. Barnhart, D. McNamara, M. Karplus, G. Monsalve. The 2015 Gorkha Earthquake and the Structure of a Himalayan Intracontinental Subduction Channel from Geodesy, Seismicity, and Seismic Imaging, Fall AGU, T54C-02.
- Mahan, K., V. Schulte-Pelkum, W. Shen, J. Stachnik, J. S. Caine, R. Russo. Distributions of high-velocity lower crust and seismic anisotropy across the continental U.S.: Integration of seismic, xenolith, and surface geologic data to address lithospheric dynamics and history, Fall AGU, T13G-07.
- Schulte-Pelkum, V., K. Mueller, T. Becker, S. Brownlee, K. Mahan. Constraints on seismic anisotropy in ductile rock fabric and application to imaging fault roots in southern California, SCEC annual meeting, Palm Springs, CA.
- (plenary talk)* Schulte-Pelkum, V., K. Mahan, T. Becker, S. Brownlee, R. Russo. Fault roots, shear zones, and lithospheric deformation from receiver functions and rock sample anisotropy, with quantitative comparisons to other structural, stress, and strain observables, Earthscope National Meeting, Anchorage.
- Schulte-Pelkum, V., T. Becker, M. Miller. Lithospheric fabric and shear zones in Southern California and the Basin and Range from anisotropic receiver function conversions and other stress and strain observables, SSA annual meeting, Denver, Seismological Research Letters 88(2B), 607.
- Schulte-Pelkum, V., K. Mueller, S. Brownlee, T. W. Becker, K. H. Mahan. Constraints on seismic anisotropy in ductile rock fabric and application to imaging fault roots in southern California, SCEC annual meeting, Palm Springs, CA.
- 2016**
- (Invited)* Schulte-Pelkum, V., K. Mahan, W. Shen, J. Stachnik. Contrasts in Lower Crustal Structure and Evolution Between the Northern and Southern Rocky Mountains From Xenoliths and Seismic Data. Fall AGU, T53D-01.
- Schulte-Pelkum, V., K. Mahan, W. Shen, J. Stachnik. Proterozoic assembly signature and its overprint in lower crustal seismic velocity structure across North America. GSA annual meeting, Denver, CO. Abstracts with Programs - GSA 48(7), Abstract no. 230-5.
- Schulte-Pelkum, V., S. Brownlee, K. Mahan, A. Raju, C. Condit. Expression of lithospheric shear zones in rock elasticity tensors and in anisotropic receiver functions and inferences on the roots of faults and lower crustal deformation. Fall AGU, T14B-01.
- Schulte-Pelkum, V., K. Mueller. Fault-parallel shear fabric in the ductile crust of Southern California imaged using receiver functions. SCEC annual meeting, Palm Springs, CA.
- 2015**
- Schulte-Pelkum, V., E. Bergman, A. Ghods, J. Lave, K. Motaghi. Seismicity and crustal structure of the Zagros Fold-and-Thrust Belt, SEE7 (7<sup>th</sup> international conference on seismology and earthquake engineering, 18-21 May 2015, Tehran, Iran.

*(Invited)* Schulte-Pelkum, V., K. Mahan. 4-D structure of the conterminous U.S.: Continental assembly, crustal growth, and deformation history from receiver functions, xenoliths, and structural mapping. Fall AGU, T14A-08.

Schulte-Pelkum, V., V. Levin. A comparison of seismic crustal and mantle deformation indicators along the Himalayan arc. Fall AGU 2015, T21C-2839.

#### **2014**

Schulte-Pelkum, V., K. Mahan. Mapping Shear Zones, Faults, and Crustal Deformation Fabric with Receiver Functions. Fall AGU, S21C-4453.

Schulte-Pelkum, V., K. Mahan. Crustal deformation and anisotropy across USArray from receiver functions. IRIS annual meeting, Sunriver, Oregon.

#### **2013**

Schulte-Pelkum, V., F. T. Wu; H. Kuo-Chen. Coherent Deformation Throughout the Lithosphere in the Taiwan Orogen From Foliation Mapping Using Receiver Functions. Fall AGU, T21G-04.

Mahan, K., V. Schulte-Pelkum. Foliation Mapping at Depth Using Receiver Functions. Fall AGU, DI21C-01.

Schulte-Pelkum, V., E. Bergman, J. Lave, A. Ghods. Investigating basement involvement in the Zagros fold-and-thrust belt using S-P delay time mapping of seismicity and receiver functions. GSA Denver, Denver, CO. Abstracts with Programs – GSA 45(7), 671.

*(Invited)* Schulte-Pelkum, V., F. T. Wu; H. Kuo-Chen.: Taiwan crustal anisotropy from receiver functions. Taiwan Geosciences Assembly, Taoyuan, Taiwan.

#### **1996 – 2012**

30 first-author/presenter posters and talks, 4 invited.

### **DEPARTMENTAL TALKS**

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In-situ observations of deep rock deformation. Geological Sciences Colloquium, 2018.

NSF grant writing and soft-money research. Geological Sciences researcher and graduate student Friday lunch seminar series, January 20, 2017.

Linking geodynamics and seismology: Mantle flow under the western U.S. from shear wave splitting. Geological Sciences colloquium, September 20, 2006.

Finding half-digested India under the Himalaya. Geological Sciences colloquium, September 23, 2005.

### **PROFESSIONAL SERVICE**

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#### **Editor**

Deputy Editor-in-Chief, The Seismic Record, Seismological Society of America, 2021-present

Associate Editor, Journal of Geophysical Research-Solid Earth, 2018-2020

#### **Committees**

Incorporated Research Institutions for Seismology (IRIS) board of directors, 2018-2020

Incorporated Research Institutions for Seismology (IRIS) president search committee, 2019-2020  
 AGU honors committee for Aki award, 2017-2018  
 IRIS Electromagnetic Advisory Committee, 2015-2017  
 IRIS Data Management System Standing Committee, 2012-2015  
 EarthScope Transportable Array Advisory Committee, 2014  
 Chair, EarthScope Transportable Array Working Group, 2012-2013  
 EarthScope Transportable Array Working Group, 2010-2012

### **Reviews and Panels**

Panelist, Fall AGU 2021: Great Unsolved Questions in Tectonophysics  
 Panelist, NSF Geophysics program, 2018, 2019  
 Panelist, NSF postdoctoral fellowship program, several rounds  
 NSF ad-hoc reviewer (Geophysics, EarthScope, SEDI, Tectonics, CAREER, MG&G, GeoPRISMS, Instr./Fac., Postdoc programs; avg. 5 proposals/yr)  
 Journal peer reviewer (avg. ~12 papers/yr)

### **Convened/Co-convened sessions**

Fall AGU 2023:  
 GSA annual meeting 2022: Evaluation of Proterozoic Tectonic Styles in North America and Their Influence on Phanerozoic Structures and Mineralization  
 Fall AGU 2019: Life and Death of Cratons: Craton Interactions with Collision, Subduction, and Volcanism - Global Perspectives and the Wyoming Province as an Example  
 Fall AGU 2017: Seismic Anisotropy and Deformation in the Continental Crust  
 Fall AGU 2015: Crustal structure and evolution across the continental U.S.: What did we glean from EarthScope?  
 Fall AGU 2014: Seismic Anisotropy in the Continental Crust: Combining Perspectives of Seismology, Petrology, and Mineral Physics  
 Fall AGU 2006: Crustal Fabric, Seismic Anisotropy, and Deformation

## **TEACHING EXPERIENCE**

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### ***INSTRUCTOR OF RECORD***

Spring 2024	Principles of Geophysics (GEOL 3330), CU Boulder
Spring 2022	Principles of Geophysics (GEOL 3330), CU Boulder
Fall 2021	Field Geophysics (GEOL 4714/5714), CU Boulder
Spring 2021	Exploring Earth (GEOL 1010), CU Boulder
Summer 2020	Exploring Earth (GEOL 1010), CU Boulder
Spring 2020	Principles of Geophysics (GEOL 3330), CU Boulder
Spring 2015	Principles of Geophysics (GEOL 4310), CU Boulder
Fall 2014	Field Geophysics (GEOL 4714/5714), CU Boulder

## MENTORING

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### **Postdoctoral scholars advised:**

William Shinevar, NSF postdoctoral fellow, 2021-2024

Omero Felipe Orlandini, postdoctoral fellow, 2019

### **Graduate students advised/co-advised:**

Michael Frothingham, PhD 2023 (Geological Sciences)

Jacob Sims, PhD in progress (Geological Sciences)

### **Ph.D. and/or comprehensive exam committee member for:**

Siyuan Sui, PhD 2024 (Stony Brook University)

Konstantinos Gkogkas, PhD 2024 (University of Utah)

Chuanming Liu, PhD 2023 (Physics)

Elize Chavez, MSc 2022 (Geological Sciences)

Kyren Bogolub, PhD 2021 (Geological Sciences)

Omero Felipe Orlandini, PhD 2019 (Geological Sciences)

Lili Feng, PhD 2019 (Physics)

Melissa Bernardino, PhD 2019 (Geological Sciences)

Ye Tian, PhD 2017 (Physics)

Cailey Condit, PhD 2017 (Geological Sciences)

Justin Ball, PhD 2016 (Geological Sciences)

Jiayi Xie, PhD 2016 (Physics)

Daniel Zietlow, PhD 2016 (Geological Sciences)

William Yeck, PhD 2015 (Geological Sciences)

Weisen Shen, PhD 2014 (Physics)

**Undergraduate students advised/co-advised:**

Makayla Mather, RESESS intern, Native American, 2020, GSA presentation

Zuliet Cabrera Gomez, RESESS intern, Dominican American, 2020, AGU presentation

Jordan Wachholtz, RESESS intern, LGBTQ, 2018, AGU presentation, now graduate student,  
UNLV

Anissha Raju, Malaysian, honors thesis “Characterization of Elastic Tensors of Rocks with respect to Seismic Anisotropy”, summa cum laude, graduated 2017; coauthored peer-reviewed publication, now at Petronas, Malaysia

Travis Payeur, UROP project, graduated 2016, now at NanoSeis

Diana Rattanasith, RESESS intern, Lao American, AGU presentation, 2013-2014, now senior geologist, Haley & Aldrich

Mollie Pettit, IRIS intern, AGU presentation, 2008, now data scientist, Netflix

Arianne Dean, IRIS intern, AGU presentation, 2007

**OUTREACH**

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The Himalayan continental collision: Tectonics and reconstruction after the Nepal earthquake, three years on. Nederland community library talk in conjunction with non-profit Educate the Children, Nepal, April 25, 2018.

Snowball Earth and hothouse Earth: Climate in deep time. Nederland community library local scientist seminar series, March 14, 2017.

Procurement, installation help, and interpretation materials for educational TC-1 slinky school seismometers: Estes Park high school, Estes Park, CO (2012; assistance for building additional seismometer from scratch by high school science club, 2014) and Bureau of Land Management Mojave Trails National Monument visitor center, Needles, CA, 2017.

Rock types and food tectonics unit (field trip and lab), Nederland Elementary school, Fall 2015.

**FIELD WORK AND EXPEDITIONS** 

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Mojave fault roots experiment, Co-PI, 15-station passive array in Mojave, CA, 2017-2019.

The North Face climbing expedition, Leader (6 climbers and 4 film crew), Czech Republic, 2008.

Himalayan Nepal Tibet broadband seismic experiment, field crew, Nepal, 2002.

Fault zone guided waves seismic experiment, field crew, Anza-Borrego desert, CA, 2000.

Hector Mine aftershock experiment, field crew, 29 Palms Marine base, CA, 1999.

**LANGUAGES** 

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German (fluent), Japanese (fluent speaking), English (fluent).

**PROFESSIONAL AFFILIATIONS** 

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American Geophysical Union (since 1996)

Geological Society of America (since 2010)

Seismological Society of America (since 2012)