VITAE CHARLES A. LANGSTON

PERSONAL DATA

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EDUCATION

1972	B.S.	(Geology), Case Western Reserve University
1974	M.S.	(Geophysics), California Institute of Technology
1976	Ph.D.	(Geophysics), California Institute of Technology

PROFESSIONAL EXPERIENCE

California Institute of Technology

1972-1974	Research Assistant
1974-1975	Louis D. Beaumont Fellow
1975-1976	Research Assistant
1976-1977	Research Fellow
1980	Visiting Associate

The Pennsylvania State University

atory
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The University of Memphis, CERI

2000-2001	Distinguished Visiting Professor
2001-2023	Professor of Seismology and Earth Structure
2004-2008	Director for Research
2008-2022	Director
2024-present	Professor Emeritus

PROFESSIONAL ACTIVITIES

Society Membership

American Geophysical Union

Associate Editor for *Jour. Geophys. Res.* (red) 1980-1982 Seismology Section Chairman for the 1985 Spring Meeting Seismology Section Chairman for the 1986 Spring Meeting

Seismological Society of America

Associate Editor for Earthquake Notes 1979-1990 Technical Chairman for the 1980 meeting of the Eastern Section Associate Editor for the *Bulletin of the Seismological Society of America* 1985 - 1988 Board of Directors 1988-1990 Vice President 1989 President 1990 Editor for the *Bulletin* 1992 – 1995 Member of *SRL* Editor Search Committee 2001 Executive Committee of the Eastern Section 2002-2009 (Secretary, vice-Chair, Chair, 5th member) Member of the Government Relations Committee 2012-2015 Member of the Reid Medal Committee 2012-2015 Geological Society of America Acoustical Society of America Oughtred Society

Other Professional Service

Member of the USGS ANSS Steering Committee 2013-2017 Member of the USGS proposal review panel on Earthquake Hazards 1983, 1984, 1987, 1988, 1993, 2012 Reviewer of proposals for the National Science Foundation. Member of the IRIS Global Seismic Network Committee 1993-1995 Member of the IRIS Joint Seismic Program Committee 1993-1995 Member of the IRIS USArray Advisory Committee 2009-2011 Member of the IRIS CEUSN Working Group 2015-2017 Member of the UNAVCO Plate Boundary Observatory Advisory Committee 2012-2015 Member of Committee for DOD Graduate Fellowships - 1989 Consultant for the Arms Control and Disarmament Agency (now Bureau of Verification, Department of State) Member of Red Team on the Verifiability of the Comprehensive Test Ban Treaty, Arms Control and Disarmament Agency, 1997 Consultant for Industry Member of the Committee on Seismology, Commission on Geosciences, Environment, and Resources, National Research Council 1991-1997 Chair of the NSF Visiting Committee for the Southern California Earthquake Center

AWARDS

ARCO Outstanding Junior Faculty Award (1981) Fellow of the American Geophysical Union (2003) Dunavant Professor, College of Arts and Sciences (2008-2011) Jesuit Seismological Association Award, Eastern Section SSA October 2011 Outstanding Reviewer for 2012 Geophysical Journal International "P.I. Millionaire" from University of Memphis, February 28, 2012 Outstanding Reviewer for 2019 Seismological Research Letters

RESEARCH INTERESTS

Broad Band Seismology Regional Wave Propagation Source Modeling Theoretical Wave Propagation in General Elastic Media Field Geophysics VITAE:

Observatory Seismometry Acoustics

CURRENT RESEARCH ACTIVITIES

Ground Motion Studies in the Central U.S. Infrasound/Seismic studies Wave Gradiometry Seismic Strains Array Studies

SIGNIFICANT PERSONAL ACTIVITIES

World Tang Soo Do Association Sam Dan (3rd degree Black Belt) Trumpet Performance

GOOGLE SCHOLAR STATISTICS (as of 8/20/2024)



110-index	127	57

53

27

h-index

REFEREED PUBLICATIONS

- 1. Langston, C.A. and D.V. Helmberger. Interpretation of body and Rayleigh waves from NTS to Tucson. *Bull. Seis. Soc. Am.*, 64:1919-1929 (1974).
- 2. Langston, C.A. and D.V. Helmberger. A procedure for modeling shallow dislocation sources. *Geophys. J. R. Astr.* Soc., 42:117-130 (1975).
- 3. Langston, C.A. A body wave inversion of the Koyna, India, earthquake of December 10, 1967, and some implications for body wave focal mechanisms. *Jour. Geophys. Res.*, 81:2517-2529 (1976).
- 4. Langston, C.A. and R. Butler. Focal mechanism of the August 1, 1975, Oroville earthquake. *Bull. Seis. Soc. Am.*, 66:1111-1120 (1976).
- 5. Langston, C.A. Body wave synthesis for shallow earthquake sources: inversion for source and earth structure parameters, Ph.D. thesis, California Institute of Technology, 214 pages (1976).
- 6. Langston, C.A. Corvallis, Oregon, crustal and upper mantle receiver structure from teleseismic P and S waves. *Bull. Seis. Soc. Am.*, 67:713-724 (1977).
- 7. Langston, C.A. and D.E. Blum. The April 20, 1965, Puget Sound earthquake and the crustal and upper mantle structure of western Washington. *Bull. Seis. Soc. Am.*, 67:693-712 (1977).
- 8. Burdick, L.J. and C.A. Langston. Modeling crustal structure through the use of converted phases in teleseismic body waveforms. *Bull. Seis. Soc. Am.*, 67:677-692 (1977).
- 9. Langston, C.A. The effect of planar dipping structure on source and receiver responses for constant ray parameter. *Bull. Seis. Soc. Am.*, 67:1029-1050 (1977).

- Langston, C.A. The February 9, 1971, San Fernando earthuake: a study of source finiteness in teleseismic body waves. *Bull. Seis. Soc. Am.*, 68:1-30 (1978).
- 11. Langston, C.A. Moments, corner frequencies, and the free surface. Jour. Geophys. Res., 83:3422-3426 (1978).
- 12. Langston, C.A. A single-station fault-plane solution method. Geophys. Res. Letters., 6:41-44 (1979).
- 13. Langston, C.A. Structure under Mount Rainier, Washington, inferred from teleseismic body waves. *Jour. Geophys. Res.*, 84:4749-4762 (1979).
- 14. Langston, C.A. A note on spectral nulls in Rayleigh waves. Bull. Seis. Soc. Am., 70:1411-1414 (1980).
- Langston, C.A. and J.M. Dermengian. "Comment on 'Seismotectonic aspects of the Markansu Valley, Tadjikstan, earthquake of August 11, 1974' by J. Jackson, P. Molnar, H. Patton, and T. Fitch." *Jour. Geophys. Res.*, 86:1091-1093 (1981).
- Langston, C.A. Source inversion of seismic waveforms: the Koyna, India, earthquakes of September 13, 1967. Bull. Seis. Soc. Am., 71:1-24 (1981).
- 17. Langston, C.A. Evidence for the subducting lithosphere under southern Vancouver Island and western Oregon from teleseismic P wave conversions. *Jour. Geophys. Res.*, 86:3857-3866 (1981).
- 18. Langston, C.A. A study of Puget Sound strong motion. Bull. Seis. Soc. Am., 71:833-903 (1981).
- 19. Barker, J.S. and C.A. Langston. Inversion of teleseismic body waves for the moment tensor of the 1978 Thessaloniki, Greece, earthquake. *Bull. Seis. Soc. Am.*, 71:1423-1444 (1981).
- 20. Langston, C.A. and C.M. Isaacs. A crustal thickness constraint for central Pennsylvania. *Earthquake Notes*, 52:13-22 (1981).
- 21. Barker, J.S. and C.A. Langston. Moment tensor inversion of complex earthquakes. *Geophysical Journal*, 68:777-803(1982).
- 22. Langston, C.A. Aspects of Pn and Pg propagation at regional distances. Bull. Seis. Soc. Am., 72:457-471 (1982).
- 23. Langston, C.A. Single station fault plane solutions. Bull. Seis. Soc. Am., 72:729-744 (1982).
- Langston, C.A., J.S. Barker and G.B. Pavlin. Point source inversion techniques. *Phys. Earth Planet Int.*, 30:228-241 (1982).
- 25. Herrmann, R.B., C.A. Langston, and J. Zollweg. The Sharpsburg, Kentucky earthquake of July 27, 1980. *Bull. Seis. Soc. Am.*, 72:1219-1239 (1982).
- Langston, C.A. Comments on "The corner frequency shift, earthquake source models, and Q, by T.C. Hanks". Bull. Seis. Soc. Am., 72:1427-1432 (1982).
- Langston, C.A., and W.A. Arnold. Moment tensor inversions and dipping slabs. *Geophysical Research Letters*, 9:1290-1293 (1982).
- Pavlin, G.B. and C.A. Langston. Source depth determination using multi-modal Rayleigh spectral ratios and linear discriminant analysis: a study of the reservoir-induced seismic sequence at Lake Kariba, Africa (Sept. 1963-Aug. 1974). Bull Seis. Soc. Am., 73:59-82 (1983).
- 29. Langston, C.A. Kinematic analysis of strong motion P and SV waves from the Sterling event. *Jour. Geophys. Res.*₂ 88:3486-3497 (1983).
- 30. Barker, J.S., and C.A. Langston. A teleseismic body-wave analysis of the May 1980 Mammoth Lakes, California, earthquakes. *Bull. Seis. Soc. Am.*, 73:419-434 (1983).
- 31. Pavlin, G.B. and C.A. Langston. An integrated study of reservoir-induced seismicity and Landsat Imagery at Lake Kariba, Africa. *Photogrammetric Engineering and Remote Sensing*, 49:513-525 (1983).
- Lee, Jia-Ju and C.A. Langston. Three-dimensional ray tracing and the method of principal curvature for geometric spreading. *Bull. Seis. Soc. Am.*, 73:765-780(1983).
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- Johnston, D.E. and C.A. Langston, The effect of assumed source structure on inversion of earthquake source parameters: the eastern Hispaniola earthquake of 14 September 1981. *Bull. Seis. Soc. Am.*, 74:2115-2134 (1984).
- Hebert, L. and C.A. Langston, Crustal thickness estimate at AAE (Addis-Ababa, Ethiopia) and NAI (Nairobi, Kenya) using teleseismic P-wave conversions. *Tectonophysics*, 111:299-327 (1985).

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- Burger, R.W. and C.A. Langston, Source mechanism of the May 18, 1980, Mount St. Helens eruption from regional surface waves. <u>Jour. Geophys. Res.</u>, 90:7653-7665 (1985).
- Langston, C.A. and C.E. Baag, The validity of ray theory approximations for the computation of teleseismic SV waves. *Bull. Seis. Soc. Am.*, 75:1719-1728 (1985).
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- 48. Langston, C.A., Depth of faulting during the 1968 Meckering, Australia, earthquake sequence determined from wave form analysis of local seismograms, *Jour. Geophys. Res.*, 92:11,561-11,574 (1987).
- 49. Wagner, G.S., and C.A. Langston, East African earthquake body wave inversion with implications for continental structure and deformation, *Geophys. J. R. astr Soc.*, 94:503-518(1988).
- 50. Kiratzi, A.A., and C.A. Langston, Estimation of earthquake source parameters of the May 4, 1972 event of the Hellenic arc by the inversion of waveform data, *Phys. Earth Plan. Int.*, 57:225-232(1989).
- 51. Langston, C.A., Scattering of teleseismic body waves under Pasadena, California, *Jour. Geophys. Res.*, 94:1935-1951 (1989).
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- 53. Wagner, G.S. and C.A. Langston, Some pitfalls and trade-offs in source parameter determination using body wave inversion and modeling, *Tectonophysics*, *166*:101-114(1989).
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- 55. Williams, D.E. and C.A. Langston, Observational test for wave propagation effects in local earthquake seismograms, *Seismological Research Letters.*, 61:109-116(1990).
- 56. Furlong, K.P., and C.A. Langston, Geodynamic aspects of the Loma Prieta earthquake, *Geophysical Research Letters.*, 17:1457-1460(1990).
- 57. Langston, C.A., K.P. Furlong, K.S. Vogfjord, R.H. Clouser and C.J. Ammon, Analysis of teleseismic body waves radiated from the Loma Prieta earthquake, *Geophysical Research Letters.*, *17*:1405-1408(1990).
- 58. Vogfjord, K.S., and C.A. Langston, Analysis of regional events recorded at NORESS, *Bull. Seism. Soc. Am.,* 80:2016-2031(1990).
- 59. Langston, C.A., and C.J. Ammon, Scattering of teleseismic body waves along the Hayward-Calaveras fault system, *Bull. Seism. Soc. Am*, 81:576-591(1991).
- 60. Kiratzi, A.A., and C.A. Langston, Moment tensor inversion of the 1983 January 17 Kefallinia event of Ionian Islands (Greece), *Geophys. Jour. Int., 105*:529-536(1991).
- 61. Clouser, R.H., and C.A. Langston, Qp-Qs relations in a sedimentary basin using converted phases, *Bull. Seism. Soc. Am.*, *81*:733-750(1991).
- 62. Langston, C.A., Wave propagation theory and synthetic seismograms, *Reviews of Geophysics*, Supplement, U.S. National report to international union of geodesy and geophysics 1987-1990, 662-670, (April 1991).

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- 64. Kiratzi, A.A., G.S. Wagner, and C.A. Langston, Source parameters of some large earthquakes in northern Aegean determined by body waveform inversion, *PAGEOPH*, 135: 515-527 (1991).
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- 66. Wagner, G. S. and C. A. Langston, Body-to-surface wave scattered energy in teleseismic coda observed at the NORESS seismic array, *Bull. Seism. Soc. Am.*, 82, 2126-2138 (1992).
- 67. Langston, C.A., An integrated study of crustal structure and regional wave propagation for southeastern Missouri, *Bull. Seism. Soc. Am.*, 84, 105-118 (1994).
- 68. Zhang, Jie, and C.A. Langston, Dipping structure under Dourbes, Belgium, determined by receiver function modeling and inversion, *Bull. Seism. Soc. Am.*, 85, 254-268.
- 69. Nyblade, A.A., and C.A. Langston, East African earthquakes below 20km depth and their implications for crustal structure, *Geophys. J. Int.*, 121, 49-62 (1995).
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- 71. Langston, C. A., Anatomy of regional phases and source characterization of the Soviet Joint Verification Experiment, underground nuclear explosion, *Bull. Seism. Soc. Am.*, 85, 1416-1431 (1995).
- 72. Zhang, J., and C. A. Langston, Constraints on oceanic lithosphere structure from deep-focus regional reciever function inversions, *J. Geophys. Res.*, 100, 22,187-22,196 (1995).
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- 74. Langston, C. A., The SsPmp phase in regional wave propagation, Bull. Seism. Soc. Am., 86, 133-143 (1996).
- 75. Zhang, J., and C.A. Langston, Array observations of the Shear-Coupled PL wave, *Bull. Seism. Soc. Am.*, 86, 538-543 (1996).
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- 77. Vogfjord, K.S., and C.A. Langston, Characteristics of short-period wave propagation in regions of Fennoscandia, with emphasis on Lg, *Bull. Seism. Soc. Am.*, 86, 1873-1895 (1996).
- 78. Nyblade, A.A., K.S. Vogfjord, and C.A. Langston, P wave velocity of Proterozoic upper mantle beneath central and southern Africa, J. Geophys. Res., 101, 11,159-11,172 (1996).
- 79. Zhao, M., C.A. Langston, and A.A. Nyblade, Lower crustal rifting in the Rukwa graben, East Africa, *Geophys. J. Int.*, 129, 412-420 (1997).
- 80. Last, R. J., A. A. Nyblade, and C. A. Langston, Crustal structure of the East African plateau from receiver functions and Rayleigh wave phase velocities, *J. Geophys. Res.*, 102, 24,469-24,483 (1997).
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- 86. Zhao, M., C. A. Langston, A. A. Nyblade, Upper mantle structure beneath southern Africa from modeling regional seismic data, *Jour. Geophys. Res.*, 104, 4783-4794 (1999).
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- 94. Langston, C. A., Local earthquake wave propagation through Mississippi embayment sediments: II. Influence of local site velocity structure on Qp-Qs determinations, *Bull. Seism. Soc. Am., 93,* 2685-2702 (2003).
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- 99. Langston, C.A., P. Bodin, C. Powell, M. Withers, S. Horton, and W. Mooney, Bulk sediment Qp and Qs in the Mississippi embayment, central United States, *Bull. Seism. Soc. Am.*, 95, 2162-2179 (2005).
- 100. Langston, C.A., P. Bodin, C. Powell, M. Withers, S. Horton, and W. Mooney, Explosion source strong ground motion in the Mississippi embayment, *Bull. Seism. Soc. Am., 96,* 1038-1054 (2006).
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- 102. Lin, T.-L., and C.A. Langston, Anomalous acoustic signals recorded by the CERI seismic network, *Seism. Res. Lett.*, 77, 572-581 (2006).
- 103. Langston, C.A., Spatial gradient analysis for linear seismic arrays, Bull. Seism. Soc. Am., 97, 265-280 (2007).
- 104. Langston, C.A., Wave gradiometry in two dimensions, Bull. Seism. Soc. Am., 97, 401-416 (2007).
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- 106. Lin, T.-L., and C.A. Langston, Infrasound from thunder: A natural seismic source, GRL, 34, L14304, doi:10.1029/2007GL030404 (2007).
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- 112. Langston, C.A., and C. Liang. Gradiometry for polarized seismic waves, *Jour. Geophys. Res.*, 113, B08305, doi:10.1029/2007JB005486 (2008).
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- 114. Liang, C., and C.A. Langston. Three-dimensional crustal structure of eastern North America extracted from ambient noise, *Jour. Geophys. Res.*, 114, B03310, doi:10.1029/2008JB005919 (2009).

- Lawrence, Z., P. Bodin, and C.A. Langston. In situ measurements of nonlinear and nonequilibrium dynamics in shallow, unconsolidated sediments, *Bull. Seism. Soc. Am.*, 99, doi:10.1785/0120080177, 1650-1670 (2009).
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- Silber, E. A., D. C. Bowman, C. G. Carr, D. P. Eisenberg, B. R. Elbing, B. Fernando, M. A. Garces, R. Hasser, S. Krishnamoorthy, C. A. Langston, Y. Nishikawa, J. Webster, J. F. Anderson, S. Arrowsmith, S. Bazargan, L. Beardslee, B. Beck, J. W. Bishop, P. Blom, B. Bracht, D. L. Chichester, A. Christe, K. Cummins, J. Cutts, L. Danielson, C. Donahue, K. Eack, M. Fleigle, D. Fox, A. Goel, D. Green, Y. Hasumi, C. Hayward, D. Hicks, J. Hix, S. Horton, E. Hough, D. P. Huber, M. A. Hunt, J. Inman, S. M. A. Islam, J. Izraelevitz, J. D. Jacob, J. Clarke, J. Johnson, R. J. KC, A. Komjathy, E. Lam, J. LaPeirre, K. Lewis, R. D. Lewis, P. Liu, L. Martire, M. McCleary, E. A. McGhee, I. Mitra, A. Nag, L. O. Giraldo, K. Pearson, M. Plaisir, S. K. Popenhagen, H. Rassoul, M. R. Giannone, M. Samnani, N. Schmerr, K. Spillman, G. Srinivas, S. K. Takazawa, A. Tempert, R. Turley, C. Van Beek, L. Viens, O. A. Walsh, N. Weinstein, R. White, B. Williams, T. C. Wilson, S. Wyckoff, M.-Y. Yamamoto, Z. Yap, T. Yoshiyama, and C. Zeiler (2024). Geophysical

observations of the 24 September 2023 OSIRIS-REx sample return capsule re-entry, *Planetary Science Journal*, (accepted June 2024), doi: 10.3847/PSJ/ad5b5e.

171. Tan, J., W. Wang, C. A. Langston (2024). Full waveform inversion based on dynamic time warping and application to reveal the crustal structure of western Yunnan, southwest China, *Jour. Geophys. Res.*, (Accepted for publication August 20, 2024).

BOOK REVIEWS

1. Langston, C.A., Quakes, Shakes and Fakes, *The Big One – The Earthquake That Rocked Early America and Helped Create a Science*, <u>Geotimes</u>, December, 50-51 (2004).

NON-REFEREED PUBLICATIONS

- 1. Langston, C.A. Reservoir induced seismicity: Those dam earthquakes. *Earth and Mineral Sciences*, 49, No. 4:37 (1980).
- Langston, C.A., Propagation of teleseismic SV waves, in *The VELA Program, A twenty-five year review of basic research*, A.U. Kerr, ed., Defense Advanced Research Projects Agency, pp. 296-305 (1985).
- Langston, C.A., Body wave propagation in three-dimensional source and receiver structure, in *The VELA Program, A twenty-five year review of basic research*, A.U. Kerr, ed., Defense Advanced Research Projects Agency, pp. 424-432 (1985).
- 4. Langston, C.A., Source parameter determination for earthquakes in India using wave form inversion techniques, in *Earthquake Disaster Mitigation Research, Proceedings of the Indo-U.S. Workshop on Earthquake Disaster Mitigation Research, January 19-23, New Dehli, India*, vol. I, 1987.
- 5. Langston, C.A., An introduction to regional seismic wave propagation and analysis of yield for Soviet underground nuclear explosions, report for the Arms Control and Disarmament Agency, 1990.
- 6. Langston, C. A., Too close to the tremors of the Earth, in *Natural and Technological Disasters: Causes, Effects and Preventive Measures.* Edited by S.K. Majumdar, G.S. Forbes, E.W. Miller and R.F. Schmalz, The Pennsylvania Academy of Sciences (1992).
- Owens, T. J., A. A. Nyblade, and C. A. Langston. The Tanzania broadband experiment. *IRIS Newsletter*, 14 (1): 5-7 (1995).
- 8. Langston, C.A. (1995). TELEDB A teleseismic database and moment tensor inversion system, tutorial for the shortcourse on moment tensors, Incorporated Research Institutions in Seismology (IRIS), Berkeley, California.
- 9. Langston, C.A. The death of peer review? Seism. Res. Letters, 66(4): 3 (1995).
- 10. Nyblade, A.A., C. Birt, C.A. Langston, T.J. Owens, and R. Last, Seismic experiment reveals rifting of Craton in Tanzania, *EOS*, 77, 517-521 (1996).
- 11. Owens, T. J., H. P. Crotwell, A. A. Nyblade, R. Brazier, C. Langston, Data report for the 1994-95 Tanzania passive-source seismic experiment, PASSCAL data report #97-005, IRIS Consortium, U. of Washington (1997).
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- Langston, C. A., C. A. Powell, and G. Patterson (2002). Strong ground motion in the New Madrid seismic zone and lifeline vulnerability, Proceedings of the Fourth China-Japan-USA Trilateral Symposium on Lifeline Earthquake Engineering, Qindao, China, edited by Y. Hu, S. Takada, and A. S. Kiremidjian.
- 14. Nyblade, A.A. and C.A. Langston (2002). Broadband seismic experiments probe the East African Rift, Eos, Trans. AGU, 83 (37), 408-409.
- 15. Langston, C.A., W. Mooney, P. Bodin, C. Powell, M. Withers (2002). Experiment in New Madrid Zone to Employ Active Source, Eos, Trans. AGU, 83 (42), p473.
- 16. Bodin, P., C.A. Langston, G. Patterson, C. Powell, M. Withers, Earthscope science for mid-America, *EOS*, *86*, 68-69 (2005).
- 17. Langston, C.A., Seismological Society of America Eastern Section Meeting Report, Seism. Res. Lett., 77, 87-112 (2006).

PARTICIPATION IN WORKSHOPS

- Joint California Institute of Technology National Science foundation seminar workshop on strong ground motions held February 12-15, 1978, Rancho Santa Fe, California. Presented a paper entitled: Deterministic modeling of source mechanisms utilizing near- and far- field seismic data: The 1971 San Fernando earthquake.
- 2. U.S. Geological Survey Earthquake Parameters conference held March 19-21, 1979, Denver, Colorado. Presented a paper entitled: Inversion of wave form data for source parameters.
- 3. U.S. Geological Survey workshop on earthquake hazards in the Puget Sound Region held October 13-15, 1980, Seattle area. Presented a paper entitled: A study of Puget Sound strong ground motion.
- 4. Symposium on earthquake algorithms--1981 General Assembly of the International Association of Seismology and Physics of the Earth's Interior held July 28, 1981, London, Ontario. Presented a paper entitled: Point source inversion techniques.
- Air Force meeting on "The physics of nonisotropic source effects from underground explosions" held March 25-26, 1982, Las Vegas, Nevada. Presented a paper entitled: Kinematic analysis of strong motion P and SV waves from the Sterling Event.
- 6. Symposium on earthquake algorithms--XVIII General Assembly, 1983, of the International Union of Geodesy and Geophysics held August 24, 1983, Hamburg, FDR. Presented an invited paper entitled: Time domain inversion for earthquake parameters using point source models. Was a member of a panel discussing earthquake algorithms.
- 7. Workshop on Global Seismological Networks held October 20-21, 1983, La Jolla, California.
- IRIS Symposium "Design goals for a global seismographic network and data management center" held May 30, 1985.
- 9. PASSCAL Symposium "Lithospheric studies with large arrays" held May 27-28, 1985.
- 10. USGS/FEMA Workshop on "Earthquake Hazards in the Puget Sound, Washington, Area" held October 29-30, 1985, Seattle Washington.
- Indo-U.S. Workshop on Earthquake Disaster Mitigation Research held in New Dehli, India, January 19-23, 1987. A paper was presented entitled: Source parameter determination for earthquakes in India using wave form inversion techniques.
- 12. Symposium on Regional Seismic Arrays and Nuclear Test Ban Verification, Oslo, Norway, February 1990. Was invited with Kristin Vogfjord to give a talk entitled "Analysis of regional events recorded at NORESS".
- 13. Second Annual IRIS Workshop, Hilton Head, S.C., March 1990. Was invited to give a talk entitled "Experience with GSN data in inferring source rupture processes: Loma Prieta earthquake".
- U.S. Geological Survey Earthquake Hazards Reduction Program Regional Workshop, Alexandria, Virginia, June 9, 1990. Workshop was concerned with formulating policy for the U.S.G.S. for their NEHRP participation.
- 15. Sixth Annual IRIS Workshop, Glendale, CA, April 1994.
- 16. Seventh Annual IRIS Workshop, Grand Teton National Park, June 1995.
- 17. Was invited to give a workshop for the IRIS consortium on moment tensor inversion, December 15 16, 1995, held in Berkeley, California. The workshop involved constructing a software package for teleseismic body wave inversion in addition to a interactive computer presentation.
- 18. Ninth Annual IRIS Workshop, Breckenridge, CO, June 1997.
- 19. IRIS Consortium Instrumentation Workshop, Sante Fe, New Mexico, November 1997.
- 20. U.S.G.S. New Madrid Source Workshop, CERI, Memphis, TN, January 2000.
- 21. 12th Annual IRIS Workshop, Rockport, Maine, May 2000.
- 22. Consortium for Regional Wave Propagation in Asia, Lamont EO, Columbia University, February 15 and 16, 2001
- 23. Mid America Earthquake Center/USGS Workshop on synthetic ground motions for central and eastern North America. Held at University of Memphis, July 11-12, 2002.
- 24. EarthScope Complementary Geophysics Workshop, Denver, CO, March 2-3, 2003.
- 25. IRIS Broadband Seismic Sensor Workshop, Lake Tahoe, CA, March 24-26, 2004. Presented a paper entitled "Seismological perspectives on broadband tilt, strain, and rotation measurement".
- 26. EarthScope Science for Mid America Workshop, Memphis, TN, August 17-19, 2005. Co-Convener.
- 27. EarthScope National Meeting, March 27-30, 2007, Monterey, CA.

- 28. Central U.S. Borehole Geo-Observatory, Memphis, TN, May 3-4, 2007. Co-Convener. Presented a talk on scientific targets in the NMSZ.
- 29. Attended the UNAVCO/EARTHSCOPE/USGS workshop "Aseismic slip, non-volcanic tremor, and earthquakes" at Dunsmuir Lodge, Sidney, British Columbia, Feb. 25-28, 2008, and presented a paper entitled "Possible non-volcanic tremor discovered in the Reelfoot fault zone, northern Tennessee".
- 30. Attended the IRIS/NSF workshop for the Long Range Science Plan for Seismology, Sept. 18-19, 2008. Presented a paper entitled "Continuum Seismic Recording".
- 31. Attended the EarthScope National Meeting in Boise, ID, May 12-15, 2009.
- 32. Advancing New Madrid Region Time-History Determination meeting. An AEG Shlemon Specialty Conference, June 3-5, 2009, Memphis, TN. Presented a talk entitled "Waveguide effects in the Mississippi embayment sediments that impact local earthquake ground motions.
- 33. Meeting of the Central and Eastern U.S. (CEUS) Earthquake Hazards Program, October 28-29, 2009. Presented the keynote address "Research Challenges in the CEUS".
- 34. EarthScope Workshop for Park and Museum Educators in the New Madrid-Central US Region, March 17-19, 2011, Memphis, TN. Presented a talk "Future New Madrid Earthquakes scientific controversy".
- 35. Indo-US Bilateral Workshop on Intraplate seismicity, 16-18 January 2012, Gujarat India. Presented an invited talk entitled "Wave propagation, crust, and mantle structure within intraplate rift basins".
- 36. CEUS Earthquake sources workshop for the USGS National Seismic Hazard Maps, 22-23 February 2012, University of Memphis. Presented a talk entitled "Magnitude of the February 7, 1812 Event from Geological Data".
- 37. IRIS "Large N" Workshop, Seattle, WA, May 24, 2012. Presented an invited talk entitled "Continuum seismic recording and wave gradiometry".
- 38. UNAVCO Strain Meter Workshop, IGPP, UCSD, 10-13 October 2012. Presented an invited talk entitled "Geodesy and Seismic Waves" with co-author Buck Grant.
- 39. Langston, C.A. Empirical constraints on broadband array designs, given at the IRIS workshop on arrays in global seismology, May 15- 16, 2013, Raleigh, NC.
- 40. Langston, C.A. Plenary talk entitled: Doing some new things with EarthScope data, given at the 2013 National Meeting of the EarthScope project, May 13-15, 2013, Rayleigh, NC.
- 41. Co-Organized and implemented the Central and Eastern U.S. Earthquake Hazards Research Review and Planning Workshop for the USGS held at the FedEx Center, 25-26 February 2014. There were 14 USGS attendees and 50 academic/industry/government attendees. See the URL http://www.memphis.edu/ceri/CEUS/ for more information. Presented a talk entitled "Lg wave propagation and ground motions".
- 42. Langston, C.A. From Large N to point arrays and back again. Presented at the SEG/AGU Summer Research Workshop in Vancouver, Canada, 22-24 July 2014.
- 43. Bockholt, B.M., and C.A. Langston. Surface wave gradiometry of the US Transportable Array. Poster presentation at the SEG/AGU Summer Research Workshop in Vancouver, Canada, 22-24 July 2014.
- 44. Attended the SEG 2015 Distinguished Instructor Short Course: Engineering Seismology with Applications to Geotechnical Engineering, presented by Oz Yilmaz. 17 October 2015, New Orleans, LA. Received 0.5 continuing education units from the SEG Continuing Education Program.
- 45. Attended the 2015 85th Annual meeting of the SEG, 18-21 October 2015, New Orleans, LA.
- 46. I was an invited instructor for the 2017 IRIS-EarthScope USArray Data Processing Short Course that was held at Indiana University August 7-11. The theme of the workshop was analysis and data handling for the IRIS Wavefields Community Experiment that was deployed at the end of June 2016 near Enid, Oklahoma. I gave a presentation on my array calibration research and also prepared software and data for two demo projects that the class performed. I also served as faculty advisor for several student group projects. Approximately 30 senior graduate students and postdoctoral researchers participated in the workshop along with 5 other instructors.
- 47. I was an invited speaker for the 2018 IRIS Seismic Instrumentation Technology Symposium held at the Tucson Marriott University Park, Tucson, AZ, 30-31 October 2018. I gave a presentation on my strain and rotation research and also prepared a poster presentation.
- 48. Langston, C. A. (2019). Velocity structure of the embayment sediments, presented at the New Madrid Seismic Zone Structure Symposium held at CERI, University of Memphis, November 1, 2019.

- 49. Yang, Y., and C. A. Langston (2019). Full waveform ambient noise tomography for the northern Mississippi embayment, presented at the New Madrid Seismic Zone Structure Symposium held at CERI, University of Memphis, November 1, 2019.
- 50. Liu., C., and C. A. Langston (2019). Crustal and uppermost mantle shear wave velocity and radial anisotropy beneath the Mississippi embayment from ambient noise tomography, presented at the New Madrid Seismic Zone Structure Symposium held at CERI, University of Memphis, November 1, 2019.
- Langston, C. A. (2020). Seismic response of thick unconsolidated sediments, U.S. Geological Survey Coastal Plain Amplification Virtual Workshop, October 5 & 7, 2020.

INVITED LECTURES

- Was an invited speaker October 18, 1984 at the Department of Geological Sciences and Environmental Studies, State University of New York at Binghamton. Presented a seminar entitled: Source characteristics of the May 18, 1980, St. Helens Eruption.
- 2. Was an invited speaker February 28, 1985 at the Aldridge Laboratory of Applied Geophysics, Henry Krumb School of Mines, Columbia University in the City of New York. Presented a seminar entitled: Body wave inversion.
- 3. Was an invited speaker March 26, 1986 at the Dept. of Terrestrial Magnetism, Carnegie Institution of Washinton. Presented a seminar entitled: The southwest seismic zone of Australia.
- 4. Was an invited speaker January 14, 1987 at Dept. of Geology, University of Glasgow, Scotland. Presented a seminar entitled: The southwest Australian seismic zone: Near-surface rupture in a continental shield area.
- 5. Was an invited speaker January 30, 1987 at the Australian Bureau of Mineral Resources, Canberra, Australia. Presented a seminar entitled: The southwest Australian seismic zone: Near-surface rupture in a continental shield area.
- 6. Was invited to give a talk entitled "Deterministic modeling of short-period waveforms" at the 1989 Fall meeting of the American Geophysical Union.
- Was invited to give a talk entitled "Thrust faulting in an Archean Shield: The Meckering, Australia, earthquake sequence" at SUNY Binghamton, Department of Geological Sciences and Environmental Studies, May 11, 1990.
- 8. Langston, C.A., Intraplate earthquakes in Eurasia (Invited Talk), 13th annual PL/DARPA Seismic Research Symposium, 8-10 October 1991, held in Keystone, CO.
- 9. Invited to speak at the Berks campus of PSU for the 19th Breakfast with Penn State on May 3, 1994. I gave a community presentation on Earthquakes in Reading, PA.
- 10. Was an invited speaker November 8, 1999, at CERI, University of Memphis. Presented a seminar entitled: "Cratonic survival under attack of the rift zones!".
- 11. Was an invited speaker September 25, 2000, at Division of Geological and Planetary Sciences, Caltech. Presented a seminar entitled: "Illuminating rifting processes of the East African Rift in Tanzania, East Africa".
- 12. Was an invited speaker October 13, 2000, at the Department of Earth and Atmospheric Sciences, St. Louis University. Presented a seminar entitled: "Illuminating rifting processes of the East African Rift in Tanzania, East Africa".
- 13. Was invited to give a talk on "Analysis of regional wave propagation from broadband seismograms" at Lamont EO, Columbia University for the Consortium on Regional Wave Propagation in Asia, Febrary 15, 2001.
- 14. Langston, C.A. (2001). Teleseismic source models and source depth constraints for events of the Bhuj earthquake sequence, EOS Supplement 82(47), p F941, Invited talk for Fall meeting of the AGU.
- 15. Was invited to present a session on "Wave Propagation" at the CBE (Consequence Based Engineering) Institute for the Mid America Earthquake Center at Texas A&M University, January 8, 2003.
- 16. Was invited to present a talk at Central Missouri State University entitled "Tanzania Safari East African Rift" under the CERI Speakers program, November 12, 2002.
- 17. Was invited to present a talk entitled "ESEE-The Embayment Seismic Excitation Experiment" at the Monthly meeting of the Memphis Chapter of the ASCE, Fogelman Center, February 19, 2003.
- 18. Was invited to present two talks at St. Louis University, MO, under the CERI Speakers program, October 31, 2003. One talk entitled "The Smoking and Gun and Science" was given to an environmental geology class. The other, entitled "Tanzania Safari" was give to a general departmental audience.

- 19. Was invited to present a talk at the University of Arkansas, Fayetteville, AR, entitled "Tanzania Safari East African Rift" under the CERI Speakers program, January 16, 2004.
- 20. Was invited to present a talk at the University of Missouri, at Columbia, MO, entitled "ESEE-the Embayment Seismic Excitation Experiment" under the CERI Speakers program, January 30, 2004.
- 21. Langston, C.A., Site reading blues in the Mississippi embayment, for the AGU fall meeting, *EOS Suppl.*, Abstract S41C-03 (2004).
- 22. Was invited to present a session on "Wave Propagation" at the CBE (Consequence Based Engineering) Institute for the Mid America Earthquake Center at Texas A&M University, January 5, 2005.
- 23. Was invited to present a talk at the University of Illinois, Department of Geosciences, Feb. 23, 2007, entitled "The scientific mystery of the New Madrid seismic zone".
- 24. Was invited to present a talk at Chevron headquarters, San Rafael, CA, on December 11, 2007, entitled "Seismic Wave Gradiometry".
- 25. Was invited to present a talk at the University of Western Ontario, London, Ontario, Department of Earth Sciences, Feb. 15, 2008, entitled "Gradiometry, Thunder, and Tremor: An Unusual Excursion Above and Below Ground".
- 26. Was invited to present a talk at the University of Washington, Seattle, Department of Earth and Space Sciences on Feb. 29, 2008, entitled entitled "Gradiometry, Thunder, and Tremor: An Unusual Excursion Above and Below Ground".
- 27. Presented the keynote address "Research Challenges in the CEUS" at the October 2009 USGS Meeting of the Central and Eastern U.S. Earthquake Hazards Program.
- 28. Engineers' Club of Memphis, Inc., Invited to give a talk entitled "What's new in the New Madrid Seismic Zone". September 21, 2009, Memphis, TN.
- 29. Invited to give a presentation (with M.B. Magnani) to the Federal Judges of Western District of Tennessee October 15, 2009. Co-presented "CERI, Earthquake Hazards, and new results from the New Madrid Seismic Zone".
- 30. Invited to give a presentation at Rhodes College at the annual Physics Expo entitled "Earthquakes, Explosions, Meteors and Other Physics in the MidSouth". February 27, 2009.
- 31. Invited to give a presentation at the University of Memphis "Earthquake Hazard Update for the University Community" for the Community Disaster Preparation conference. February 12, 2009.
- 32. Langston, C.A. The seismo-acoustic boundary layer, abstract, paper given at the 2010 Annual SSA meeting Portland, OR, Seism. Res. Lett., 81, p 327 (2010).
- 33. Langston, C.A. EarthScope, USArray, and Infrasonics, paper given at the 7th meeting of the MidSouth Chapter of the Acoustic Society of America, Rhodes College, 10/09/10.
- 34. Langston, C.A. Low-frequency acoustic/seismic coupling in deep sediments: Skyquakes look like earthquakes in the Mississippi embayment, Annual Fall meeting of the American Geophysical Union, San Francisco, CA (2010).
- 35. Participated in a panel discussion at Rhodes College, Memphis, TN, "Understanding the Nuclear Situation in Japan", April 18, 2011.
- 36. Public speaking engagement (with Kent Moran) at Missouri State University West Plains, 6 February 2012. Presented 2 parts of the program: "Earthquakes and Earthquake Effects" and "What if?".
- 37. Congressional Hazards Caucus Alliance public briefing, Rayburn Building, Washington D.C., 29 March 2012. Presented a talk to Congressional staffers entitled " Understanding Earthquakes in the New Madrid Seismic Zone".
- 38. Rotary Club of Memphis Central, 20 July 2012, Holiday Inn, University of Memphis. Presented a talk entitled "The Center for Earthquake Research and Information at the University of Memphis: Serving the Nation, State of Tennessee, and Scientific Community".
- 39. Shelby County Commission, Memphis, TN, 19 September 2012. Presented testimony on earthquake hazards in Shelby County, TN.
- 40. USGS/CERI Coordination meeting at CERI, University of Memphis, 7 February 2013. Organized meeting and presented a review talk of CERI –USGS coordination efforts. The Director of the USGS, Marcia McNutt, and congressional liaisons from Representative Cohen's and Senator Alexander's office also attended.
- 41. State Fire Marshall, Nashville, TN, 10 July 2013. Presented testimony on earthquakes hazards and seismic codes for Shelby County.

- 42. Midtown Rotary Club presentation on earthquakes and earthquake insurance "Are Earthquakes a Problem for Memphis?". 27 August 2013.
- 43. Gave public testimony before the Mississippi River Commission during its public meeting 7 April 2014 with P. Bording (Alabama A&M University) for its high-water Spring river inspection. Presented "STEM workforce development: Earthquake Science and Geophysical Techniques for Geotechnical Problems in the Mississippi River Valley".
- 44. Invited presentation at Chengdu University of Technology, Chengdu, China, 1 April 2015, "Preliminary results from the Northern Embayment Lithosphere Experiment".
- 45. Invited presentation at the Institute of Geodesy and Geophysics of Chinese Academy of Sciences, Wuhan, China, 6 April 2015, "Preliminary results from the Northern Embayment Lithosphere Experiment".
- 46. Three invited presentations at the University of Science and Technology of China, Heifei, China, 7 April 2015, "Preliminary results from the Northern Embayment Lithosphere Experiment", "Vertical Seismic Wave Gradiometry at SAFOD", and "Seismo-acoustic Wave Propagation of the Sonic Boom Created by the Space Shuttle in the Central U.S.".
- 47. Invited presentation at Peking University, Beijing, China, 9 April 2015, "Vertical Seismic Wave Gradiometry at SAFOD".
- 48. Invited presentation at the Chinese University of Geosciences, Beijing, China, 10 April 2015, "Preliminary results from the Northern Embayment Lithosphere Experiment".
- 49. Langston, C.A. (2016). Beam Forming Arrays, given at the IRIS Oklahoma Wavefields Community Experiment, Enid, OK, June 21, 2016.
- 50. Langston, C.A. (2016). Gradiometers, given at the IRIS Oklahoma Wavefields Community Experiment, Enid, OK, June 21, 2016.
- 51. Langston, C.A., and G. Patterson (2016). Earthquake forecast and public outreach briefing, given to the Mississippi River Commission public meeting April 12, 2016, U.S. Army Corps of Engineers.
- Langston, C. A. (2017). From Hugo Benioff to aLIGO: Strains, Rotations, and Other New Developments in Seismology, (Invited) Department of Geology Colloquiuum, University of Illinois, 15 September 2017.
- 53. Langston, C.A. (2018). The New Madrid Seismic Zone, U.S. Army Corps of Engineers and Mississippi River Commission, New Madrid, MO, aboard the MV Mississippi, 16 April 2018.
- 54. Langston, C.A. (2018). 2018 Earthquake Forecast for the New Madrid Seismic Zone, Briefing for the U.S. Army Corps of Engineers and Mississippi River Commission, New Madrid, MO, aboard the MV Mississippi, 16 April 2018.
- 55. Langston, C. A. (2018). From Hugo Benioff to aLIGO: Strains, Rotations, and Other New Developments in Seismology, Department of Geology, University of Houston, 23 March 2018.
- Langston, C.A. (2018). The Mathematical Magic of Continuous Wavelet Transforms: Noise Removal, Signal Removal, and Interesting Research Questions, University of Memphis – CERI, 12 October 2018.
- 57. Langston, C.A. (2018). The Mathematical Magic of Continuous Wavelet Transforms: Noise Removal, Signal Removal, and Interesting Research Questions, University of Illinois, 30 November 2018.
- 58. Langston, C. A. (2021). Phased array processing and template correlation using the continuous wavelet transform, Lawrence Livermore National Laboratory, virtual seminar, 25 March 2021.
- 59. Langston, C. A. (2024). Seismo-acoustic coupling: catching the sonic boom from the OSIRIS-REx capsule return mission, Sandia National Laboratories, virtual seminar, 25 July 2024.

PAPERS PRESENTED AT TECHNICAL AND PROFESSIONAL MEETINGS

- 1. Langston, C.A. and D.V. Helmberger. Interpretation of body and Rayleigh waves from NTS to Tucson. (Abstract): *Trans. Am. Geophys. Union.* 54:1140 (1973). Presented at 1972 Fall A.G.U. meeting.
- Langston, C.A. The relationship between the teleseismic P-wave and near field strong motion observations for the February 9, 1971, San Fernando earthquake. (Abstract): *Earthquake Notes* 46:39 (1975). Presented at 1974 meeting of the Eastern section of the Seis. Soc. Am.
- 3. Langston, C.A. and R. Butler. Preliminary focal mechanism of the August 1, 1975, Oroville earthquake. (Abstract): *Trans. Am. Geophys. Union* 56:1023 (1975). Presented at 1975 A.G.U. meeting.

- 4. Langston, C.A. A body wave inversion of the Koyna, India, earthquake of 10 December 1967, (1975). Presented at the First International Symposium on Induced Seismicity held September 15-19, 1975, in Banff, Canada.
- Langston, C.A. The effect of planar dipping structure on source and receiver responses for constant ray parameter. (Abstract): *Trans. Am. Geophys. Union* 57:953 (1976). Presented at 1976 Fall A.G.U. meeting.
- 6. Butler, R. and C.A. Langston. The Hawaiian earthquake of April 26, 1973: A double event. (Abstract): *Trans. Am. Geophys. Union* 57:954 (1976). Presented at 1976 Fall A.G.U. meeting.
- Langston, C.A. and D.E. Blum. The April 29, 1965, Puget Sound earthquake and the crustal and upper mantle structure of western Washington and Oregon. (Abstract): *Trans. Am. Geophys. Union* 58:167 (1977). Presented at the 1976 Pacific Northwest Regional A.G.U. meeting and 11th symposium on Mathematical Geophysics, Germany.
- 8. Langston, C.A. The February 9, 1971, San Fernando earthquake: A study of source finiteness in teleseismic body waves. (Abstract): *Trans. Am. Geophys. Union*, 58:990 (1977). Presented at the 1977 Spring A.G.U. meeting.
- 9. Langston, C.A. Moments, corner frequencies, and the free surface. (Abstract): *Trans. Am. Geophys. Union* 59:326 (1978). Presented at the 1978 Spring A.G.U. meeting.
- 10. Langston, C.A. A single-station fault-plane solution method. Presented at the 1978 meeting of the Eastern section of the Seis. Soc. Am.
- 11. Langston, C.A. Seismograph site selection problems and regional wave propagation. Presented in March, 1979, for a DARPA/AFOSR program review.
- Langston, C.A. Structure under Mt. Rainier, Washington, inferred from teleseismic body waves. (Abstract): *Trans. Am. Geophys. Union*, 59:1142 (1978). Presented at the 1978 Fall A.G.U. meeting and the Spring 1979 meeting of the Seism. Soc. Am.
- 13. Langston, C.A. Inversion of sparse regional earthquake wave form data to deter-mine source parameters. *Trans. Am. Geophys. Union*, 60, (1979). Presented at the Spring A.G.U. meeting.
- 14. Langston, C.A. Source inversion using wave form data. (Abstract): *Trans. Am. Geophys. Union*, 60:879 (1979). Presented at 1979 Fall A.G.U. meeting.
- 15. Dermengian, J.M. and C.A. Langston. Focal mechanism of the Ms 7.2 November 29, 1975, Kalapana earthquake from a wave form correlation technique. (Abstract): *Trans. Am. Geophys. Union*, 60:895 (1979). Presented at 1979 Fall A.G.U. meeting.
- 16. Langston, C.A. Evidence for the subducting lithosphere under southern Vancouver Island and western Oregon from teleseismic P wave conversions. Presented at the Spring 1980 meeting of the Seis. Soc. Am.
- 17. Langston, C.A. A note on spectral nulls in Rayleigh waves. (Abstract): *Trans. Am. Geophys. Union*, 61:300 (1980). Presented at the 1980 Spring A.G.U. meeting.
- Henson, I.H. and C.A. Langston. Inversion for fault dislocation using teleseismic body waves. (Abstract): *Trans. Am. Geophys. Union*, 61:296 (1980). Presented at the 1980 Spring A.G.U. meeting.
- Pavlin, G.B. and C.A. Langston. Source parameter inversion of a reservoir-induced earthquake: Lake Kariba, Africa, 23 September, 1963. (Abstract): *Trans. Am. Geophys. Union*, 61:296 (1980). Presented at the 1980 Spring A.G.U. meeting.
- 20. Langston, C.A. Inversion for source parameters. Presented in May, 1980, for a DARPA/AFOSR program review.
- 21. Barker, J.S. and C.A. Langston. Moment tensor inversion of the 1978 Thessaloniki, Greece earthquake. Presented at the 1980 meeting of the Eastern section of the Seis. Soc. Am.
- 22. Pavlin, G.B. and C.A. Langston. Source parameter inversion of a reservoir-induced earthquake sequence: Lake Kariba, Africa. Presented at the 1980 meeting of the Eastern section of the Seis. Soc. Am.
- 23. Dermengian, J.M. and C.A. Langston. A correlative look at the periodicity of volcanic eruptions and the occurrence of moderate to large earthquakes at Kilauea volcano, Hawaii. Presented at the 1980 meeting of the Eastern section of the Seismological Society of America.
- 24. Barker, J.S. and C.A. Langston. Moment tensor inversion of complex earthquakes. (Abstract): *Trans. Am. Geophys. Union*, 61:1029 (1980). Presented at the 1980 Fall meeting of the A.G.U.
- 25. Langston, C.A. A study of Puget Sound strong ground motion. (Abstract): *Trans. Am. Geophys. Union*, 61:1036 (1980). Presented at the 1980 Fall meeting of the A.G.U.
- Pavlin, G.B. and C.A. Langston. Reconstructing the reservoir-induced seismic history of Lake Kariba, Africa. (Abstract): *Trans. Am. Geophys. Union*, 62:329 (1981). Presented at the 1981 Spring meeting of the A.G.U.
- 27. Langston, C.A. Single station fault plane solutions. (Abstract): *Trans. Am. Geophys. Union*, 62:331 (1981). Presented at the 1981 Spring meeting of the A.G.U.

- Langston, C.A. Calculation of regional P phases. Presented at the annual DARPA/AFOSR program review, May, 1981.
- 29. Barker, J.S., and C.A. Langston. Teleseismic body wave analysis of the May 1980 Mammoth Lakes earthquakes (Abstract): *Trans. Am. Geophys. Union*, 62:958 (1981). Presented at the 1981 Fall meeting of the A.G.U.
- Langston, C.A. Aspects of Pn and Pg propagation at regional distances (Abstract): *Trans. Am. Geophys. Union*, 62:959 (1981). Presented at the 1981 Fall meeting of the A.G.U.
- 31. Lee, J.-J., and C.A. Langston. Three-dimensional ray tracing and the method of principal curvature for geometrical spreading. Presented at the 1982 annual meeting of the Seis. Soc. of Am.
- Langston, C.A. Kinematic analysis of strong motion P and SV waves from the Sterling event. Presented at the annual DARPA/AFOSR program review, May, 1982.
- 33. Langston, C.A. Kinematic analysis of strong motion P and SV waves from the Sterling event. (Abstract): *Trans. Am. Geophys. Union,* 63:373 (1982). Presented at the 1982 Spring meeting of the A.G.U.
- 34. Lee, J.-J., and C.A. Langston. Wave propagation in a three-dimensional circular basin. (Abstract): *Trans. Am. Geophys. Union*, 63:379 (1982). Presented at the 1982 Spring meeting of the A.G.U.
- 35. McBrinn, G.E. and C.A. Langston. Structure of Trinidad using teleseismic P-wave conversions. (Abstract): *Trans. Am. Geophys. Union*, 63:380 (1982). Presented at the 1982 Spring meeting of the A.G.U.
- 36. Arnold, W.A., and C.A. Langston. Moment tensor inversions and dipping slabs. (Abstract): *Trans. Am. Geophys. Union*, 63:381 (1982). Presented at the 1982 Spring meeting of the A.G.U.
- 37. Franco, M.C., and C.A. Langston. Modeling of the Koyna, India, aftershock of 12 December, 1967. Presented at the 1982 meeting of the Eastern Section of the Seis. Soc. Am.
- 38. Langston, C.A. and J-J Lee. Effect of structure geometry on strong ground motions: the Duwamish River valley, Seattle, Washington. Presented at the 1983 Spring meeting of the Seis. Soc. Am.
- 39. Lee, J-J and C.A. Langston. Crustal structure under Pasadena, California, inferred from teleseismic P wave data. Presented at the 1983 Spring meeting of the Seis. Soc. Am.
- Langston, C.A. and C. Baag. Propagation of teleseismic SV waves. Presented at annual DARPA/AFOSR program review, May, 1983.
- 41. Baag, Chang-Eob and C.A. Langston. Shear-coupled PL (Abstract): *Trans. Am. Geophys. Union*, 64:260 (1983). Presented at the 1983 Spring meeting of the A.G.U.
- 42. Barker, J.S. and C.A. Langston. The effect of structure on moments and corner frequencies (Abstract): *Trans. Am. Geophys. Union,* 64:262 (1983). Presented at the 1983 Spring meeting of the A.G.U.
- Langston, C.A. Propagation of Teleseismic SV Waves. Presented at the annual DARPA/AFOSR program review, May, 1984.
- Langston, C.A. Body wave propagation in three-dimensional source and receiver structure. Presented at the annual DARPA/AFOSR program review, May, 1984.
- 45. Langston, C.A. The influence of alluvium geometry on strong ground motions during the 1971 San Fernando earthquake (Abstract): *Trans. Am. Geophys. Union*, 65:234 (1984). Presented at the 1984 Spring meeting of the A.G.U.
- 46. Burger, R.W. and C.A. Langston. Source mechanism of the May 18, 1980, St. Helens eruption from regional surface waves (Abstract): *Trans. Am. Geophys. Union*, 65:242 (1984). Presented at the 1984 Spring meeting of the A.G.U.
- 47. Hebert, L. and C.A. Langston. Crustal thickness estimate at AAE (Addis-Ababa, Ethiopa) and NAI (Nairobi, Kenya) using teleseismic P-wave conversions. Presented at the 1984 meeting of the Seis. Soc. Am.
- Johnston, D.E. and C.A. Langston. The effect of assumed source structure on inversion for earthquake source parameters: The eastern Hispaniola earthquake of 14 September, 1981. Presented at the 1984 meeting of the Seis. Soc. Am.
- Langston, C.A. Propagation of teleseismic SV waves. Presented at the annual DARPA/AFOSR program review, May, 1984.
- 50. Langston, C.A. Body wave propagation in three-dimensional source and receiver structure. Presented at the annual DARPA/AFOSR program review, May, 1984.
- 51. Langston, C.A. The influence of alluvium geometry on strong ground motions during the 1971 San Fernando earthquake (Abstract): *Trans. Am. Geophys. Union*, 65:234 (1984). Presented at the 1984 Spring meeting of the A.G.U.

- 52. Langston, C.A. Computation of synthetic seismograms using ray theory. Presented at the 56th annual meeting of the Seis. Soc. Am., Eastern Section, 1984.
- 53. Langston, C.A. and C-E. Baag. The validity of ray theory approximations for the computation of teleseismic SV waves (Abstract): *Trans. Am. Geophys. Union*, 65:991(1984). Presented at the 1984 Fall meeting of the A.G.U.
- 54. Baag, C.-E. and C.A. Langston. Diffracted Sp generated under the Australian shield (Abstract): *Trans. Am. Geophys. Union*, 65:1000 (1984). Presented at the 1984 Fall meeting of the A.G.U.
- 55. Langston, C.A. and C.-E. Baag. Recent developments in SV wave propagation. Presented at the annual DARPA/AFOSR program review, May 1985.
- 56. Vogfjord, K.S. and C.A. Langston. Source parameters of the Ms 6.8 Meckering, Australia earthquake of October 14, 1968: "A chip off the old block" (Abstract): *Trans. Am. Geophys. Union*, 66:963 (1985).
- 57. Langston, C.A. Source parameter constraints from strong ground motions of the April 13, 1949, Puget Sound earthquake (Abstract): *Trans. Am. Geophys. Union*, 66:067 (1985).
- Langston, C.A., A. Lakhtakia, V.K. Varadan and V.V. Varadan, Observational and theoretical studies of regional wave propagation. Presented at the DARPA/AFGL program review, Colorado Springs, CO, May 5-8, 1986.
- Wagner, G.S. and C.A. Langston, Waveform inversion of five African earthquakes and tectonic implications for continental deformation, (Abstract): *Trans. Am. Geophys. Union*, 67:304, (1986). Presented at the 1986 Spring Meeting of the A.G.U.
- 60. Langston, C.A., Local depth phases observed in aftershocks of the October 14, 1968, Meckering, Australia, earthquake, (Abstract): *Trans. Am. Geophys. Union*, 67:305, (1986). Presented at the 1986 Spring Meeting of the A.G.U.
- 61. Williams, D.E. and C.A. Langston, Wave propagation effects observed in aftershock waveforms of the January 9, 1982 Miramichi, New Brunswick earthquake. Presented at the 1986 meeting of the Eastern Section of the Seismological Society of America, Ottawa, Canada.
- 62. Langston, C.A., Waveform analysis of foreshocks and aftershocks of the October 14, 1968 Meckering, Australia earthquake: depth of faulting in an intraplate continental shield area. Presented at the 1986 meeting of the Eastern Section of the Seismological Society of America, Ottawa, Canada.
- 63. Alves, D.J. and C.A. Langston, Aspects of regional short-period wave propagation: A study of the December 1967 Koyna earthquakes, Maharashstra, India. Presented at the 1987 meeting of the Seismological Society of America, Santa Barbara, CA.
- 64. Langston, C.A. and R. Morrow, Relative isotropic moments of large explosions at the Eastern Kazakh Test site, (Abstract): *Trans. Am. Geophys. Union*, 68: (1987).
- 65. Langston, C.A., Source depth determined from local and near-regional short-period seismograms, presented at the annual AFGL/DARPA program review meeting Nantucket, Mass., May 1987.
- 66. Wagner, G.S. and C.A. Langston, Some pitfalls and trade-offs in source parameter determination using body wave inversion and modeling, presented at the XIX General Assembly of the International Union of Geodesy and Geophysics Vancouver, B.C., August 1987.
- 67. Vogfjord, K.S. and C.A. Langston, The use of combined data sets in inversion for source parameters: the Meckering earthquake of October 14, 1968, presented at the XIX General Assembly of the International Union of Geodesy and Geophysics Vancouver, B.C., August 1987.
- Langston, C.A., Determination of source depth for local earthquakes using wave form depth phases, presented at the XIX General Assembly of the International Union of Geodesy and Geophysics Vancouver, B.C., August 1987.
- 69. Langston, C.A., C. Ammon, and G.S. Wagner, Effect of three dimensional crustal structure on teleseismic receiver functions, presented at the XIX General Assembly of the International Union of Geodesy and Geophysics Vancouver, B.C., August 1987.
- Kiratzi, A.A., and C.A. Langston, Moment tensor inversion analysis of recent earthquakes in the northern Aegean trough (Greece): Implications for the tectonic regime (Abstract), *EOS*, 44:1352(1987). Presented at the annual meeting of the A.G.U.
- 71. Langston, C.A., A simple energy-flux model for teleseismic P-wave coda and implications for teleseismic receiver function studies, *EOS*, 69:405(1988). Presented at the annual meeting of the A.G.U.
- 72. Wagner, G.S., and C.A. Langston, Receiver crustal structure through array processing of P to S converted phases, *EOS*, 69:406(1988). Presented at the annual meeting of the A.G.U.

- 73. Clouser, R.H., and C.A. Langston, Lithospheric structure of southern Africa from Pnl waves, *EOS*, 69:406(1988). Presented at the annual meeting of the A.G.U.
- 74. White, D.J., and C.A. Langston, Puget Sound 3-D velocity structure from simultaneous velocity-hypocenter inversion, *EOS*, 69:406(1988). Presented at the annual meeting of the A.G.U.
- 75. Vogfjord, K.S., and C.A. Langston, Short-period regional phases recorded at NORESS, *EOS*, 69:408(1988). Presented at the annual meeting of the A.G.U.
- 76. Langston, C.A., Scattering under Pasadena, California, *Seismological Research Letters* (Abstract), 59, 40, 1988. Presented at the annual meeting of the S.S.A.
- Langston, C.A., and K.S. Vogfjord, Energy flux models for seismic scattering studies and identification of multiple crustal phases from events recorded by NORESS. Presented at the annual AFGL/DARPA program review meeting held in Fallbrook, CA, May 1988.
- 78. Clouser, R.H., and C.A. Langston, Upper mantle P-wave velocity structure of Southern Africa from Pnl waves, *Seism. Res. Letters* (Abstract), 59:103(1988). Presented at the annual meeting of the Eastern Section, S.S.A.
- 79. Langston, C.A., Deterministic aspects of receiver function data from PAS (Pasadena, CA) station and the inference of a major lower crustal discontinuity, *Seism. Res. Letters* (Abstract), 59:105, 1988. Presented at the annual meeting of the Eastern Section, S.S.A.
- 80. Wagner, G.S., and C.A. Langston, Plane wave scattering in a 2-D inhomogeneous layer over half space: a test of a radiative diffusion-energy flux model, *Seism. Res. Letters* (Abstract), 59:109(1988). Presented at the annual meeting of the Eastern Section, S.S.A.
- 81. Langston, C.A., Scattering of long-period Rayleigh waves in Western North America and the interpretation of coda Q measurements, *EOS*(Abstract), 69:1317(1988). Presented at the annual meeting of the AGU.
- 82. Langston, C.A. and C.J. Ammon, Scattering of teleseismic body waves along the Hayward-Calaveras Fault system. Presented at the 1989 annual meeting of the Seismological Society of America in Victoria, British Columbia.
- 83. Langston, C.A. and C.J. Ammon, The seismic signature of the San Andreas fault seen in teleseismic receiver function data, *EOS*, 70:395(1989). Presented at the Spring 1989 meeting of the American Geophysical Union.
- Vogfjord, K.S. and C.A. Langston, Identification and modeling of multiple crustal phases from regional events recorded by NORESS, *EOS*, 70:396(1989). Presented at the Spring 1989 meeting of the American Geophysical Union.
- 85. Langston, C.A., Energy flux models for seismic wave propagation in a scattering layer. Presented at the 1989 annual AFGL/DARPA Seismic Research Symposium held in San Antonio, Texas.
- 86. Vogfjord, K.S. and C.A. Langston, Multiple crustal phases from regional events recorded at NORESS. Presented at the 1989 annual AFGL/DARPA Seismic Research Symposium held in San Antonio, Texas.
- 87. Langston, C.A., Deterministic modeling of short-period waveforms, *EOS*, 70:1192. Presented at the 1989 Fall meeting of the American Geophysical Union.
- Langston, C.A., K.P. Furlong, C.J. Ammon, R.H. Clouser, K.S. Vogfjord, G.S. Wagner, Analysis of teleseismic body waves radiated from the Loma Prieta event. Presented at the 1989 Fall meeting of the American Geophysical Union.
- Furlong, K.P., C.A. Langston, C.J. Ammon, R.H.Clouser, K.S. Vogfjord, G.S. Wagner, Seismic rupturing in the lower crust along the San Andreas?: lessons from Loma Prieta. Presented at the 1989 Fall meeting of the American Geophysical Union.
- 90. Vogfjord, K.S. and C.A. Langston, Analysis of Regional Events Recorded at NORESS. Presented at the Symposium on Regional Arrays and Nuclear Test Ban Verification, Oslo, Norway, February 1990.
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- 336. Langston, C.A. (2016). An expedient but fascinating geophysical chimera: the Pinyon Flat Seismic Strain Point Array, abstract G33A-1078, Annual meeting of the American Geophysical Union, December 12-16, 2016, San Francisco, CA.
- 337. Mousavi, S.M., and C.A. Langston (2016). An application of reassigned time-frequency representations for seismic noise/signal decomposition, abstract S13B-2545, Annual meeting of the American Geophysical Union, December 12-16, 2016, San Francisco, CA.
- 338. Chai, C., C.J. Ammon, R.B. Herrmann, A. Mostafanejad, and C.A. Langston (2016). Seismic velocity structure beneath the eastern United States and northern Mississippi embayment, abstract S43B-2847, Annual meeting of the American Geophysical Union, December 12-16, 2016, San Francisco, CA.
- 339. Yang, Y., and C.A. Langston (2016). Local wave propagation and crustal structure tomography in northern Mississippi embayment, abstract S43B-2864, Annual meeting of the American Geophysical Union, December 12-16, 2016, San Francisco, CA.
- 340. Mousavi, S. M., and C. A. Langston (2016). Automatic denoising and detection of microseismic events using the synchrosqueezing, presented at the annual meeting of the SEG, Dallas, Texas, October 16-21, 2016.
- 341. Mousavi, S. M., and C. A. Langston (2016). Adaptive microseismic noise estimation and denoising, presented at the annual meeting of the SEG, Dallas, Texas, October 16-21, 2016.
- 342. Mousavi, S. M., and C. A. Langston (2016). Fast and novel microseismic detection using timefrequency analysis, presented at the annual meeting of the SEG, Dallas, Texas, October 16-21, 2016.
- 343. Langston, C. A. (2017). Calibrating dense spatial arrays for amplitude statics and orientation errors. Paper presented at the Annual meeting of the Seismological Society of America, Denver, CO.
- 344. Woodward, R., Langston, C. A., Sweet, J., & Anderson, K. (2017). Strategies for recording the full seismic wavefield. Paper presented at the CTBTO Science and Technology Conference, Viena, Austria.
- 345. Langston, C. A., S. M. Mousavi (2017). Adaptive seismic denoising using the synchrosqueezed continuous wavelet transform and block-thresholding, Air Force Research Laboratory Nuclear Explosion Monitoring Technical Interchange Meeting, Satellite Beach, Florida.
- 346. Langston, C. A., O. J. Bolarinwa, J. R. Sweet, K. R. Anderson and R. Woodward (2017). Performance of the broadband Golay 3x6 array associated with the 2016 IRIS Community Wavefields Experiment, Abstract S11C-0591, Fall Meeting of the American Geophysical Union, New Orleans, LA.
- 347. Langston, C. A. (2017). One to Large N Gradiometry, Abstract S23E-01 (invited), Fall Meeting of the American Geophysical Union, New Orleans, LA.
- 348. Langston, C.A. (2018). Strain, rotation, and geodetic arrays: calibrating the Pinyon Flat Gladwin Tensor Strainmeter, (poster), IRIS Seismic Instrumentation Technology Symposium, Tucson Marriott University Park, Tucson, AZ, 31 October 2018.
- 349. Woodward, R., C.A. Langston, J. Sweet, and K. Anderson (2018). Strategies for recording the full seismic wavefield, International Symposium on Deep Earth Exploration and Practices, Beijing, China, 24-26 October 2018.
- 350. Langston, C.A., and S. M. Mousavi (2018). Interactive block thresholding for seismic signal processing, *Seism. Res. Lett.*, 89, 2B, p. 786, annual meeting of the Seismological Society of America, Miami, FL, 14-17 April 2018.
- 351. Al Noman, M.N., C.A. Langston, and C.H. Cramer (2018). Lg attenuation in Oklahoma and its surrounding regions, *Seism. Res. Lett.*, 89, 2B, p. 879, annual meeting of the Seismological Society of America, Miami, FL, 14-17 April 2018.

- 352. Liu, C., C.A. Langston, C.A. Powell, C.H. Cramer (2018). Near surface to upper mantle structure in the Mississippi embayment from ambient noise tomography, S13C-04564, annual meeting of the AGU, Washington, DC, 9-15 December 2018.
- 353. Zhang, J., and C.A. Langston (2018). Separating the scattered wavefield from teleseismic P using curvelets on the Long Beach array dataset, S31D-0542, annual meeting of the AGU, Washington, DC, 9-15 December 2018.
- 354. Fadugba, O. I., C.A. Langston, and C.A. Powell (2018). Wave propagation and focal mechanisms of local earthquakes in the Charlevoix seismic zone, S31F-0574, annual meeting of the AGU, Washington, DC, 9-15 December 2018.
- 355. Langston, C.A. (2018). Calibration of borehole GTSM instruments using seismic array strain for the ANZA-PBO Network, California, S43E-0658, annual meeting of the AGU, Washington, DC, 9-15 December 2018.
- 356. Langston, C.A. (2018). Large-N gradiometry with nodal instrument arrays, *Seism. Res. Lett.*, 89, 2B, p. 867, annual meeting of the Seismological Society of America, Miami, FL, 14-17 April 2018 (invited).
- 357. Langston, C.A. (2018). ZEN and the Art of Seismic Waveform Interpretation: The Tao of Don, Broadband Waveform Seismology Workshop: Don Helmberger's Earth, National Technical University, Singapore, 1 August 2018 (invited).
- 358. Langston, C.A. (2018). Strain, Rotation, and Seismic Arrays, IRIS Seismic Instrumentation Technology Symposium, Tucson Marriott University Park, Tucson, AZ, 31 October 2018 (invited).
- 359. Bolarinwa, O. J., and C. A. Langston (2019). Calibrating the 2016 IRIS Community wavefields experiment nodal sensors for amplitude statics and orientation errors, *Seism. Res. Lett.*, 90, no. 2B, p. 879, Annual meeting of the S.S.A. Seattle, WA.
- 360. Langston, C. A., and C. P. Zeiler (2019). Analysis of local explosion waveforms for 1D crustal structure using interactive non-linear block thresholding and phased array methods, *Seism. Res. Lett.*, 90, no. 2B, p. 868, Annual meeting of the S.S.A. Seattle, WA.
- 361. Fadugba, O. I., C. A. Langston, and C. A. Powell (2019). Wave propagation analysis of the SP headwave observed in the Charlevoix seismic zone and its application for constraining source depth, *Seism. Res. Lett.*, 90, no. 2B, p. 950, Annual meeting of the S.S.A. Seattle, WA.
- 362. Aslam, K. C. Liu, and C. A. Langston (2019). Directionality of ambient noise in the Mississippi embayment: ocean and local source locations, *Seism. Res. Lett.*, 90, no. 2B, p. 975, Annual meeting of the S.S.A. Seattle, WA.
- 363. Yang, Y., C. Liu, and C. A. Langston (2019). Ambient noise empirical Green's function full waveform tomography for the Northern Mississippi embayment, *Seism. Res. Lett.*, 90, no. 2B, p. 997-998, Annual meeting of the S.S.A. Seattle, WA.
- 364. Langston, C. A. (2019). Phased array analysis using non-linear thresholding and scale-time windowing of the continuous wavelet transform of regional seismic signals, abstract IUGG19-4302, 27th IUGG General Assembly, Montreal, Canada, 7/14/19.
- 365. Bolarinwa, O. J., and C. A. Langston (2019). Appraising the performance of the 2016 IRIS community wavefields experiment gradiometer array, abstract S21D-0528, Fall meeting of the AGU, San Francisco, CA.
- 366. Fadugba, O. I., C. A. Langston, and C. A. Powell (2019). Better constraining the geometry of faults in the Charlevoix seismic zone, abstract S52C-08, Fall meeting of the AGU, San Francisco, CA.
- 367. Tan, J., and C. A. Langston (2019). From phase time inversion to dynamic time warping, abstract S53D-0471, Fall meeting of the AGU, San Francisco, CA.
- 368. Zhang, J., and C. A. Langston (2019). Recovery of local P-to-Raleigh converted wavefields from teleseismic P using curvelets on the Long Beach array dataset, abstract S41F-0596, Fall meeting of the AGU, San Francisco, CA.
- 369. Langston, C. A. (2020). Partitioning signal and noise using non-linear thresholding, AFRL Nuclear Explosion Monitoring Technical Interchange Meeting, January 28-30, 2020, Melbourne, FL.
- 370. Yang, Y., C. Liu, and C. A. Langston (2020). Processing seismic ambient noise data with the continuous wavelet transform to obtain reliable empirical Green's functions, *Seism. Res. Let.*, 91, 2B, page 1166. Annual meeting of the Seismological Society of America, Albuquerque, New Mexico, April 27-30, 2020. (Note: the meeting was cancelled because of the pandemic. There was no on-line presence except for abstracts being published by SSA.)

- 371. Langston, C.A. (2020). Phased array analysis incorporating the continuous wavelet transform, Seism. Res. Let., 91, 2B, page 1316. Annual meeting of the Seismological Society of America, Albuquerque, New Mexico, April 27-30, 2020.
- 372. Fadugba, O. I., C. A. Langston, and C. A. Powell (2020). Focal mechanisms of relocated earthquakes and new stress orientations in the Charlevoix seismic zone, *Seism. Res. Let.*, 91, 2B, page 1229. Annual meeting of the Seismological Society of America, Albuquerque, New Mexico, April 27-30, 2020.
- C. A. Langston (2020). Phased array analysis incorporating the continuous wavelet transform, paper S049-05, AGU annual meeting (online), 1-17 December 2020.
- 374. Tan, J., and C. A Langston (2020). Dynamic time warping in seismic waveform inversion, paper S062-0020, AGU annual meeting (online), 1-17 December 2020.
- 375. Fadugba, O. I., C. A. Langston, and C. A. Powell (2020). Focal mechanisms of relocated earthquakes and stress orientation in the Charlevoix seismic zone, paper S041-05, AGU annual meeting (online), 1-17 December 2020.
- 376. Zhang, J., and C. A. Langston (2020). Teleseismic P-to-Rayleigh conversions from near-surface geological structure along the Newport-Inglewood fault zone in Long Beach, California, paper S062-0016, AGU annual meeting (online), 1-17 December 2020.
- Langston, C. A. (2021). Partitioning signal and noise using non-linear thresholding, given at the online meeting of the Air Force Research Laboratory Technical Information Meeting, February 8-12, 2021.
- Langston, C. A. (2021). Phased array processing and template correlation using the continuous wavelet transform, given online to the verification group at Lawrence Livermore National Laboratory, 25 March 2021, invited.
- 379. Langston, C. A. (2021). Phased arrays for near-fault rupture observations, given online as part of the AGU Townhall for the Rupture and Fault Zone Observatory (RuFZO) 14 December 2021, invited.
- Langston, C. A. (2021). Using empirical source templates as mother wavelets in the continuous wavelet transform, given online at the annual meeting of the Seismological Society of America, 19 April 2021.
- 381. Yang, Y., C. A. Langston, C. A. Powell, and W. A. Thomas (2021). Full waveform ambient noise tomography for the northern Mississippi embayment, given online at the annual meeting of the Seismological Society of America, 23 April 2021.
- 382. Bolarinwa, O., and C. A. Langston (2022). Wave gradiometry and continuous wavelet transforming thresholding, given online at the 2022 hybrid European Geophysical Union Assembly, March 18, 2022.
- 383. Langston, C.A., and C. A. Powell (2022). Complex fault segmentation in the New Madrid Seismic Zone inferred from seismicity clustering, given at the annual meeting of the Seismological Society of America, Bellevue, WA, 19-22 April 2022.
- 384. Langston, C.A., G. Kaip, Z. Farajpour, A. Islam, C. Opara (2022). An initial look at the data from the Embayment Seismic Excitation Experiment 2022, given at the annual meeting of the Eastern Section of the Seismological Society of America, Tampa, FL, 23-25 October 2022.
- 385. Powell, C.A., C. A. Langston, and M. M. Withers (2022). New crustal velocity models and earthquake relocations for the New Madrid Seismic Zone, given at the annual meeting of the Eastern Section of the Seismological Society of America, Tampa, FL, 23-25 October 2022.
- 386. Langston, C.A., C.A. Powell, and M.M. Withers (2022). Updated fault model for the New Madrid Seismic Zone inferred from seismicity clustering, given at the annual meeting of the Eastern Section of the Seismological Society of America, Tampa, FL, 23-25 October 2022.
- 387. Farajpour, Z., C. A. Langston, S. Islam, C. Opara, G. M. Kaip (2023). Determining shear wave velocities at a deep sediment site in the Mississippi embayment using Rayleigh wave dispersion from active and passive sources, *Seism. Res. Lett.*, 94, 2B, given at the annual meeting of the Seismological Society of America, San Juan, Puerto Rico, April 2023.
- 388. Langston, C. A., G. M. Kaip, Z. Farajpour, S. Islam, C. Opara (2023). What constitutes knowledge of "site response"? the Embayment Seismic Excitation Experiment 2022 (ESEE2022), Seism. Res. Lett., 94, 2B, given at the annual meeting of the Seismological Society of America, San Juan, Puerto Rico, April 2023.

- 389. Bazargan, S., S. Horton, I. Mitra, S. Islam, and C. A. Langston (2023). Pre-field testing of infrasonic instruments before NASA's OSIRIS-REx re-entry experiment, given at the 95th annual meeting of the Eastern Section of the Seismological Society of America, Dallas, Texas, October 2023.
- 390. Langston, C. A., S. Bazargan, S. Horton, I. Mitra, and S. Islam (2023). A seismo-acoustic array experiment at Eureka, NV, to record the sonic boom from the OSIRIS-REx capsule return, 24 September 2023, given at the 95th annual meeting of the Eastern Section of the Seismological Society of America, Dallas, Texas, October 2023.
- 391. Sarker, K., C. H. Cramer, C. A. Langston, R. Bhattarai, A. Mahanama, Md S. Islam, A. Hosain (2023). Unveiling the subsurface secrets: integrated 2D Magnetotelluric resistivity and seismicity mapping of the Axial fault region in the New Madrid seismic zone, AGU Fall Meeting Abstracts, 51, GP13C-051.
- 392. Sarker, K., C. H. Cramer, C. A. Langston, R. Bhattarai, and A. Mahanama (2023). Broadband magnetotelluric study of the axial fault region of the New Madrid seismic zone, *Third International Meeting for Applied Geoscience and Energy*, pp.498-502.
- 393. Langston, C. A., S. Bazargan, S. Horton, I. Mitra, and S. Islam (2024). Array data from the University of Memphis seismo-acoustic coupling experiment fielded at the Eureka County Airport, Nevada, *Seism. Res. Lett.*, 95, 2B, given at the annual meeting of the Seismological Society of America, Anchorage, Alaska, April 2023.
- 394. Silber, E. A., D. C. Bowman, S. Krishnamoorthy, C. Carr, R. A. Haaser, B. R. Elbing, M. A. Garces, C. A. Langston, J. D. Webster, D. P. Eisenberg, E. Lam, B. Fernando, C. P. Zeiler, Y. Nishikawa, R. D. Lewis, L. A. Giraldo Ocampo, S. Arrowsmith (2024). The OSIRIS-REx sample return capsule re-entry: initial results from a historic geophysical recording campaign against an 'artificial meteor', *Seism. Res. Lett.*, 95, 2B, given at the annual meeting of the Seismological Society of America, Anchorage, Alaska, April 2023.

Research Projects

- 1. Near field -far field relationships and fault dynamics for the February 9, 1971, San Fernando earthquake. Submitted to the National Science Foundation, July 1978-February 1980, Amount: \$20,000
- 2. Calculation of strong ground motion and local field-far field relationships for the April 29, 1965, Puget Sound, Washington, earthquake. Submitted to the U.S. Geological Survey, May 1979-May 1980, Amount: \$29,000
- Stress field characteristics and detailed source mechanisms by time domain modeling of body and surface waves from reservoir related earthquake sequences. Submitted to the National Science Foundation, March 1978-August 1979, Amount: \$38,550
- 4. Improvement and evaluation of location and discriminant accuracy: Calculation of source and structure parameters at regional distances (with Roy Greenfield and Shelton Alexander). Submitted to the U.S. Air Force, started October 1978 for two-year duration, Amount: \$100,000/year
- Digitizer and plotter for general department use (with Wayne Burnham and Shelton Alexander), Submitted to the National Science Foundation, Started February 1980 for one-year duration, Amount: \$15,000
- 6. Stress field characteristics and detailed source mechanisms by time domain modeling of body and surface waves from reservoir related earthquake sequences. Submitted to the National Science Foundation, started February 1980 for a one-year duration, Amount: \$35,000
- Crustal structure of specific sites in southern California from analysis of broad-band teleseismic recordings. Submitted to the National Science Foundation, started October 1980 for a one-year duration, Amount \$38,963
- 8. Calculation of source and structure parameters at regional and teleseismic distances (Task B) (with Roy Greenfield). Submitted to the U.S. Air Force, started October 1980 for a two-year duration, Amount: \$30,000/year
- Effect of lateral heterogeneities on strong ground motion in the Puget depression. Submitted to the U.S. Geological Survey, started January 1982 for a one-year duration, Amount: \$37,000
- Study of the 1980 Mammoth Lakes Earthquakes, submitted to the National Science Foundation, started January
 1, 1983 for a two-year duration, Amount: \$65,000
- 11. Calculation of source and structure parameters at regional and teleseismic distances (with Roy Greenfield). Submitted to the U.S. Air Force, started January 1, 1983 for a two-year duration, Amount: \$150,000

- 12. Effect of lateral heterogeneities on strong ground motion. Submitted to the U.S. Geological Survey, started January 1, 1983 for a one-year duration, Amount: \$84,348
- 13. Waveform Analysis of New Brunswick Earthquake Aftershock Data. Submitted to the U.S. Geologic Survey, started July 1, 1985 for a one year duration, Amount: \$44,689.
- Calculation of source and structure parameters at regional and teleseismic distances (with Roy Greenfield). Submitted to the U.S. Air Force (AFOSR-DARPA), started January 1, 1985 for a two year duration, Amount: \$120,000.
- 15. Subduction zone structure of Oregon and northern California (with Kevin P. Furlong). Submitted to the National Science Foundation, starting date of July 1, 1986 for a two year duration, Amount: \$75,000.
- 16. Simultaneous inversion of earthquake hypocenters and velocity structure of the Puget Sound, Washington, area. Submitted to and accepted by the U.S. Geological Survey, starting date of March 1, 1987, for a one year duration, Amount: \$43,563
- Calculation of source and structure parameters at regional and teleseismic distances (with Roy J. Greenfield). Submitted to the U.S. Air Force (AFOSR-DARPA), starting date of January 1, 1987 for a two year duration, Amount: \$140,000.
- 18. Upgrade of computer facilities for AFGL/DARPA related research. Submitted to U.S. Air Force (AFGL/DARPA), starting date of March 1, 1988 for a one year duration, Amount: \$86,206.
- 19. Wave propagation at regional distances. Submitted to U.S. Air Force (AFGL/DARPA), starting date of February 1, 1989 for a two year duration, Amount: \$186,052.
- 20. Use of Telseismic SV waves in Source and Structure Inversion. Submitted to the National Science Foundation, starting date of February 15, 1990, for a two year duration, Amount: \$147,047
- 21. Composition of short-period regional phases inferred from Fennoscandian array data. Submitted to U.S. Air Force (AFGL), starting date of August 1, 1990, for a two year duration, Amount \$175,906.
- 22. Broad band regional wave propagation and lithospheric structure in the New Madrid region. Submitted to the U.S. Geological Survey, starting date of June 1, 1991, for a one year duration. Amount \$56,588.
- 23. Regional wave propagation in the Soviet Union. Submitted to DARPA/AF, starting date of June 10, 1991 for a two year duration. Amount \$223,968.
- 24. Installation of a joint U.S. NSN IRIS Station at Standing Stone, PA. Submitted to the IRIS Consortium, starting date of April, 1992 for a one year duration. Amount \$18,000.
- 25. Three dimensional wave propagation effects in teleseismic body waves. Submitted to the National Science Foundation, starting data of May 1993 for a two year duration. Amount \$119,515.
- 26. Wave propagation and source parameters in Eurasia. Submitted to AFOSR, starting date of April 15, 1993 for a two year duration(extended to Oct. 1995). Amount \$152, 852.
- 27. Seismic wave propagation in southern and central Africa (with A. Nyblade). Submitted to AFOSR, starting date of 1 November 1993 for 3 years duration. Amount \$223,077.
- Upgrade of the geophysics computing facility at the Pennsylvania State University. Submitted to the National Science Foundation (with Andrew Nyblade), starting date of March 15, 1995 for a two year duration. Amount \$45,135 (from NSF, 33% cost share).
- Collaborative research: seismic investigation of deep continental structure in Tanzania, East Africa (with A. Nyblade, K. Furlong and T. Owens). Submitted to the National Science Foundation, starting date of January 1994 for a four year duration. Amount \$553,646.
- Effect of 3D crustal velocity structure on source models of earthquakes in southern California. Submitted to the U.S. Geological Survey, starting date of 3/1/97 for a 1 year duration. Amount \$65,000.
- Seismic structure of the Afar Plume (with A. Nyblade). Submitted to the National Science Foundation, starting date of 1/1/97 for a 2 year period. Amount \$48,436.
- 32. Teleseismic response of kinematic earthquake source models in general elastic media. Submitted to the National Science Foundation, starting date of 4/1/97 for a 2 year duration. Amount \$160,000.
- Seismology and verifying nuclear test ban treaties: An initiative to link geosciences and public policy in undergraduate education. Submitted to the National Science Foundation, starting date of 9/15/98 for a 1 year period. Amount \$50,000.
- Seismology and verifying nuclear test ban treaties: An initiative to link geosciences and public policy in undergraduate education. Submitted to the College of Earth and Mineral Sciences, starting date of 9/15/98 for a 1 year period. Amount \$6,280.

- 35. Seismic Investigation of crust and upper mantle structure beneath the Ethiopia/Afar Hotspot (with A. A. Nyblade). Submitted to the National Science Foundation, starting date of 12/01/99 for a 4 year duration. Amount \$448,826.
- 36. Regional wave propagation, crustal structure, and seismic sources of central Asia. Submitted to the U.S. Department of Energy, Office of Nonproliferation and national security, starting date of 4/25/00 for a 3 year duration. Amount \$263,497.
- Broadband seismic studies of dome growth at Merapi volcano, Indonesia (with B. Voight). Submitted to the National Science Foundation, starting date of 7/01/00 for 2 year duration. Amount \$190,247.
- Upgrading Computing Hardware to Support Geoscience Initiatives (with a host of faculty). Submitted to the National Science Foundation, starting date of August 22, 2000 for a 3 year duration. Amount \$158,047.
- Seismic response of deep sediments in mid-continent (using broad band and short-period signals) (with P. Bodin). Submitted to the U.S.G.S. NEHRP program, starting date of 1/01/01 for a 2 year duration. Amount \$110,605.
- 40. Gujarat-New Madrid Seismic Zone Corrlations, Mid America Earthquake Center, 1/01/02 for 2 year duration. Amount \$120,000.
- 41. Seismic Path Modeling, Mid American Earthquake Center, 1/01/02 12/31/07. Amount \$60,000/year.
- 42. Embayment seismic excitation experiment: collaborative research with CERI and the U.S. Geological Survey, USGS NEHRP, 1/01/02-6/30/04. Amount: \$97,811.
- 43. Verification of site response, Mid America Earthquake Center, 1/01/04 12/31/07. Amount: \$160,000.
- 44. EarthScope Science workshop for mid-America (P.I. Bodin, Co-PIs Withers, Powell, Patterson, Langston), NSF 1/01/04-6/30/05. Amount: \$53,000.
- 45. Linear and non-linear wave propagation studies within sediments of the Mississippi embayment USGS NEHRP (with CoPI Bodin) 4/01/06-9/30/07. Amount: \$65,794.
- 46. Wave gradiometry for EarthScope seismic and strain data, NSF#0745898, 5/01/2008-4/30/2010, Amount: \$129,381.
- 47. Finding the path effect for shear waves in the central U.S. using broadband waveform inversion, USGS NEHRP, 6/01/09-5/31/10. Amount: \$69,717.
- 48. Detection and location of non-volcanic tremor in the New Madrid seismic zone, USGS NEHRP (with CoPIs DeShon, Horton, Withers) 9/01/09-8/31/10. Amount \$53,000.
- 49. CERI Annual Support for the USGS office 06/01/2009-05/31/2010. Amount \$59,066.
- 3D Seismic velocity model for the unconsolidated Mississippi embayment sediments from H/V ambient noise measurements (with CoPI Horton), USGS NEHRP 1/01/2010-12/31/2010. Amount \$74,837.
- 51. Continuation of Detection and location of non-volcanic tremor in the New Madrid seismic zone (with PI DeShon, co PIs Horton and Withers), 12/01/10-11/30/11, Amount \$76,815.
- 52. CERI Annual Support for the USGS office 06/01/2010-05/31/2011. Amount \$59,066.
- 53. CERI Annual Support for the USGS office 06/01/2011-05/31/2012. Amount \$59,066.
- Collaborative Research: Northern Embayment Lithosphere Experiment (NELE) (with Co PIs C.A. Powell, H. DeShon, S. Horton, R. Herrmann (St.Louis Univ.), C.J. Ammon (Penn State Univ.), National Science Foundation 6/01/2011-5/31/2016, \$816,756.
- 55. CERI Annual Support for the USGS office 9/01/2013-8/31/2014. Amount \$28,260.
- GOALI: Application of wave gradiometry to reflection seismology (with Co-P.I. I. Rabak, Global Geophysical Services). National Science Foundation 6/01/2014-5/31/2016. Amount \$64,971.
- 57. Creating a new seismic instrument from EarthScope Strainmeter Installations. National Science Foundation 6/15/2015-05/31/2017. Amount \$157,925.
- 58. Adaptive seismic denoising based on the synchrosqueezed-continuous wavelet transform and block thresholding. Air Force Research Laboratory. 01/01/2016-12/31/2017. Amount \$181,781.
- 59. Array Science for the IRIS Community Wavefields Experiment (C. A. Langston, P.I.), National Science Foundation, 6/01/17 5/31/19, \$144,770.
- 60. Partitioning signal and noise using non-linear thresholding (C.A. Langston, P.I.), Air Force Research Laboratory, 11/15/18-11/14/20, \$184,000.
- 61. Seismotectonics and seismic potential of three intraplate seismic zones (C. A. Langston, P.I., C. A. Powell, co-P.I.), USGS NEHRP, 05/0119-08/30/21, \$160,857.
- Application of rotational seismology for earthquake early warning and monitoring (C. A. Langston, P.I.), University of Memphis – Mobility Plus Project in conjunction with the Czech Academy of Sciences, 1/01/20-12/31/22, \$37,500.

63. Embayment Seismic Excitation Experiment 2022 (ESEE 2022) (C. A. Langston, P.I.), USGS NEHRP grant G22AP00201-00, 06/01/22-05/31/23, \$91,790.

POST DOCTORAL ASSOCIATES SUPERVISED

Anastasia Kiratzi (1990, PSU) Andrew Nyblade (1993, PSU) Richard Brazier (1994, PSU) Alemahu Jemberie (2004, UM) Zoya Farajpour (2022, UM)

PH.D. THESES SUPERVISED

- 1. Gregory B. Pavlin, Ph.D. graduated November, 1981. title: Source parameter inversion of a reservoir-induced seismic sequence Lake Kariba, Africa: September 1963 August 1974, a reassessment of triggering mechanisms. (PSU)
- 2. Jia-Ju Lee, Ph.D. graduated November, 1983. title: *A three-dimensional ray method and its application to the study of wave propagation in crustal structure with curved layers*. (PSU)
- 3. Chang-Eob Baag, Ph.D. graduated December, 1983. title: Computation of the Shear-coupled PL wave.
- 4. Jeffrey Scott Barker, Ph.D. graduated December, 1984. title: A seismological analysis of the May, 1980, Mammoth Lakes, California, earthquakes. . (PSU)
- 5. Gregory Wagner, Ph.D. graduated May 1991. title: Scattering effects for teleseismic plane wave propagation in a heterogeneous layer over a homogeneous halfspace. (PSU)
- 6. Kristin Vogfjord, Ph.D. graduated August 1991. title: *A study of Noress-array seismograms from local and regional events*. (PSU)
- 7. Charles Ammon, Ph.D.- graduated May 1991. title: *A contribution to the inversion of seismic body waves for earth structure and seismic source parameters*. (PSU)
- 8. Robert H. Clouser, Ph.D. graduated June 1993. title: Scattering of seismic waves by irregular interfaces. . (PSU)
- 9. Ming Zhao, Ph.D. graduated August 1998. title: Southern Africa seismic structure and source studies. . (PSU)
- 10. Qingwen Miao, Ph.D. graduated May 2007. Title: *The local magnitude scale and seismicity of the central* U.S. (UM)
- 11. Ting-Li Lin, Ph.D. graduated August 2008. Title: Infrasonic induced ground motions (UM)
- 12. Chuntao Liang, Ph.D. graduated August 2008). Title: *Studies in passive seismic imaging and wave gradiometry* (UM)
- 13. Zack Lawrence, Ph.D. graduated December 2008. Title: Active source strong motion field studies and in situ measurements on nonlinear and nonequilibrium dynamics in shallow, unconsolidated sediments (UM)
- 14. Ivan Rabak, Ph.D. graduated May 2009. Title: Crustal structure of the Reelfoot rift (UM)
- 15. Christy Chiu, Ph.D. graduated May 2010. Title: Shallow crustal structure in the upper Mississippi embayment, central USA (UM)
- 16. Elige Grant III, PhD graduated August 2010. Title: *Gladwin tensor strainmeter calibration using seismic data: instrument calibration methods and wave gradiometry applications* (UM)
- 17. Lauren Michelle Kendall, PhD graduated December 2014. Title: *High-Frequency Gradiometry* (UM)
- 18. Donny Triananda Dangkua, PhD (co-advised with C. Cramer) graduated December 2014. Title: *Engineering* seismology studies in linear and non-linear ground motion (UM)
- 19. Blaine M. Bockholt, PhD graduated August 2015. Title: A Seismogenic Study of the Central and Eastern United States (UM)
- 20. Akramalsadat Mostafanejad, PhD graduated December 2015. Title: Treatise on Seismicity and Velocity Structure of the Northern Mississippi Embayment (UM)
- 21. Seyed Mostafa Mousavi, PhD graduated August 2017. Title: Microseismic Monitoring and Denoising (UM)
- 22. Chunyu Liu, PhD graduated May 2020, Title: Understanding seismic velocity structure and its time-varying process beneath the Mississippi embayment through ambient noise analysis (UM)
- 23. Yang Yang, PhD graduated May 2020, Title: A seismologic study of the Northern Mississippi embayment (UM).

- 24. Jia Zhang, PhD graduated May 2021, Title: Use of curvelets in spatial array processing: method and wavefield analysis (UM).
- 25. Oluwaseun Idowu Fadugba, PhD graduated Summer 2021, Title: *Waveform and geodynamic modeling of seismicity associated with the Charlevoix seismic zone* (UM).
- 26. Oluwaseyi Joseph Bolarinwa, PhD graduated Summer 2022, Title: *Assessing the performance of an experimental gradiometer array* (UM).
- 27. Jiayan Tan, PhD graduated Summer 2022, Title: *Joint inversion and dynamic time warping methods to explore crustal velocity structure* (UM).

M.S. THESES SUPERVISED

- 1. Charles Manning Isaacs, Jr., M.S. graduated August, 1979. title: *State College, Pennsylvania, crustal structure by modeling of long-period P-wave forms from teleseismic earthquakes*. (PSU)
- 2. Ivan Hendrix Henson, M.S. graduated February, 1980. title: *Inversion for fault dislocation using teleseismic body waves*. (PSU)
- 3. Darryl K. Francois, M.S. graduated August, 1981. title: The tectonics of the Caribbean Plate. . (PSU)
- 4. Jeffrey S. Barker, M.S. graduated May, 1981. title: *Moment tensor inversion of complex earthquakes: The 1978 Thessaloniki, Greece, earthquake.* . (PSU)
- 5. John Michael Dermengian, M.S. graduated November, 1981. title: On the application of teleseismic body wave modeling to study the source characteristics and tectonic implications of the Kalapana, Hawaii, foreshock-mainshock sequence of November 29, 1975. (PSU)
- 6. Walter Allen Arnold, M.S. graduated May 1982. title: *Dipping slab effects on seismic source mechanisms at subduction zones*. (PSU)
- 7. Maria Clara Franco, M.S. graduated September, 1982. title: Modeling of the Koyna, India, aftershock of December 12, 1967. (PSU)
- 8. Geraldine E. McBrinn, M.S. graduated September, 1982. title: *Structure of Trinidad using teleseismic P-wave conversions*. (PSU)
- 9. Louis Hebert, M.S. graduated June, 1983. title: Crustal thickness estimate at AAE (Addis-Ababa, Ethiopia) and NAI (Nairobi, Kenys) using teleseismic P-wave conversions. (PSU)
- David Earle Johnston, M.S. graduated December, 1983. title: The effect of assumed source structure on inversion for earthquake source parameters: The eastern Hispaniola earthquake of 14 September, 1981. . (PSU)
- 11. Roy W. Burger, M.S. graduated May, 1984. title: Source mechanism of the May 18, 1980, St. Helens eruption from regional surface waves. (PSU)
- 12. Richard Seme-Abomo, M.S. graduated August, 1985. title: *A theoretical study of the method of amplitude variation with offset for offshore Cameroon exploration*. (PSU)
- 13. Adam N. Mirkin, M.S. graduated December, 1985. title: *Three-dimensional ray tracing in the determination of local source structure effects on teleseismic P-waves from buried explosions: Application to Yucca Flat, Nevada*. (PSU)
- 14. Glenn Eli Baker, M.S. graduated at the University of Washington, Seattle, Washington, May, 1985. title: Source parameters of the magnitude 7.1, 1949, South Puget Sound, Washington earthquake determined from long-period body waves. Mr. Baker was in residence at Penn State during Fall, 1984, and Spring, 1985, and under Langston's direction. (PSU)
- 15. Gregory S. Wagner, M.S. graduated June 1986. title: *Waveform inversion for five African earthquakes and tectonic implications for continental deformation*. (PSU)
- 16. Kristin S. Vogfjord, M.S. graduated August 1986. title: *The Meckering earthquake of October 14, 1968. A possible downward propagating rupture.* (PSU)
- 17. Nancy L. Neimann, M.S. graduated December 1986. title: Upper mantle P-Velocity structure between eastern North America and Hispaniola. (PSU)
- 18. David E. Williams, M.S. graduated December 1986. title: *Wave propagation effects observed in aftershock* waveforms of the January 9, 1982 Miramichi, New Brunswick earthquake. (PSU)
- 19. David J. Alves, M.S. graduated May 1987. title: Aspects of regional short-period wave propagation: A study of the December 1967 Koyna earthquakes, Maharashstra, India. (PSU)

- 20. Robert H. Clouser, M.S. graduated November 1988. title: Upper Mantle P-wave velocity structure beneath Southern Africa from Pnl waves. (PSU)
- 21. Jie Zhang, M.S. graduated August 1991. title: Array observations of shear-coupled PL and shear-coupled P waves in western Europe. (PSU)
- 22. Christine Ecker, M.S. graduated December 1992. title: Source parameters from near regional earthquake data recorded at Garm, Tadjikistan. (PSU)
- 23. John K. Hammer, M.S. graduated August 1993. title: *Modeling the effect of San Andreas fault structure on receiver functions using elastic 3-D finite-difference*. (PSU)
- 24. Mingguang Wang, M.S. graduated August 1994. title: Use of teleseismic broadband SV waves in source parameter studies. (PSU)
- 25. Ming Zhao, M.S. graduated May 1996. title: *Teleseismic waveform analysis of a deep crustal earthquake* associated with the Rukwa Graben, Tanzania. (PSU)
- 26. Seung Yoo, M.S. graduated May 1998. title: Ice Effects in Receiver functions West Antarctica. (PSU)
- 27. Meghan Keohane, M.S. graduated August 2001. title: *Mapping the subsurface structure of the Tecopa basin, California using gravity and magnetic data*. (PSU)
- 28. Heather Hennessey Parizek, M.S. graduated May 2001. title: Upper Mantle Anisotropy and the SKS Receiver Function. (PSU)
- 29. Concilia Fasola, M.S. graduated December 2005. Title: Reprocessing of USGS Mississippi river shallow seismic data. (UM)
- 30. Juanjuan Cao, M.S. graduated August 2006. Title: *Structure in the upper crust at the southern terminus of the Blytheville arch, eastern Arkansas.* (UM)
- 31. Mahari Ayele, M.S. graduated August 2012. Title: *Crustal velocity structure around the SAFOD Borehole using vertical wave gradiometry*. (UM)
- 32. Md Monsurul Huda, M.S. graduated December 2014. Title: *Coherence and variability of ground motion over* 600m of the nonvolcanic tremor array site at Mooring, TN. (UM)
- 33. Alireza Shahjouei, M.S. graduated August 2015. Title: *Time Stability of Horizontal-To-Vertical ratio ambient noise in the Mississippi Embayment* (UM)
- 34. John Meredith, M.S. graduated August 2016. Non-thesis option (UM).
- 35. Chloë Glover, M.S. graduated December 2019. Title: *Transmission and reflection imaging of stratigraphy from passive array data* (UM).

UNDERGRADUATE INTERNS SUPERVISED

- 1. Brian McCalebb, NSF REU from Mid-America Earthquake Center, summer 2005. Seismic Path Modeling (with Alemayehu Jemberie)
- 2. Duayne Rieger, NSF REU from Mid-America Earthquake Center, summer 2007. Seismic velocity structure modeling using reflection data.
- 3. Blaine Bockholt, IRIS intern from Brigham Young University-Idaho, summer 2010. Detection and location of non-volcanic tremor in the New Madrid seismic zone.
- 4. Adonara Mucek, IRIS intern from University of Hawaii, summer 2011. Seismic/infrasound monitoring of Arkansas swarm earthquakes.
- 5. Alex Snyder, IRIS intern from Clemson University, summer 2014. Reflection response from the autocorrelation of ambient noise as recorded on the Transportable Array and Northern Embayment Lithosphere Experiment.

SERVICE TO UNIVERSITY – PENN STATE

- 1. Fall 1978 Fall 1982: Member of the committee on Computing Facilities for the Department of Geosciences.
- 2. Spring and Summer 1979: Member of the Brochure Committee for the Department of Geosciences.
- 3. January 1982-1985: Co-Director of the Department's (Geophysics Graduate Program) Seismic Observatory (with S.S. Alexander).
- 4. Spring 1982 present: Member of the Committee on computing facilities for the College of Earth and Mineral Sciences.

- 5. Spring 1983 1985: Member of the Search Committee for Dept. of Geosciences.
- 6. Summer 1984 1985: Member of the Search Committee for Department Chairman, Department of Geosciences.
- 7. Fall 1984 1985: Chairman of the Department of Geosciences Computer Committee.
- 8. Fall 1985: Director of the Seismic Observatory.
- 9. 1986-1987: Member of the Geosciences Promotion and Tenure Committee.
- 10. Spring 1986 Fall 1986: Member of the Geosciences Faculty Search Committee.
- 11. Spring 1986: Member of the College search committee for Associate Dean of Research.
- 12. Spring 1987: Member of the Committee for Reorganization of the Graduate Programs of the Dept. of Geosciences.
- 13. Fall 1988: Member of Dept. of Geosciences Graduate Program Committee
- 14. Fall 1988: Member of Dept. of Geosciences Admissions Committee.
- 15. Fall 1988: Chairman of Dept. of Geosciences Computer Committee.
- 16. Spring 1989: Member of Dept. of Geosciences Admissions Committee
- 17. Spring 1989: Member of Dept. of Geosciences Promotion and Tenure Committee
- 18. Spring 1989: Member of Dept. of Geosciences Graduate Program Committee
- 19. Spring 1989: Member of Dept. of Geosciences Committee on Strategic Planning: External Environment
- 20. Fall 1989: Member of Dept. of Geosciences Admissions Committee
- 21. Fall 1989: Member of Dept. of Geosciences Promotion and Tenure Committee
- 22. Spring 1990: Member of Dept. of Geosciences Admissions Committee
- 23. Summer 1990- : Member of Dept. of Geosciences Graduate Program Committee
- 24. Spring 1991 -Chair of the Geophysics Curricular Group, Department of Geosciences
- 25. 1992 Member of the Arnulf Muan Distinguished Lecture Committee, Department of Geosciences
- 26. 1992 Chair of the Geophysics Position Search Committee, Department of Geosciences
- 27. 1992 Member of the University Distance Education Task Force
- 28. 1991 Member of the Ph.D. Candidacy Committee, Department of Geosciences
- 29. 1993 Member of the Geodynamics Position Search Committee, Department of Geosciences
- 30. 1994 Member of the Dept. Computer committee
- 31. 1995 Member of the Dept. Computer committee
- 32. 1995 Chair of the Geophysics Curricular Group. We went through extensive revisions of the Geophysics curriculum in Fall 1995.
- 33. 1996/97 Member of the Dept. Computer committee
- 34. 1996/97 Chair of the Geophysics Curricular Group
- 35. 1996/97 Member of the Dept. Admissions Committee
- 36. 1996/97 Member of the Dept. Graduate Program Committee
- 37. 1997/98 Chair of the Geophysics Curricular Group
- 38. 1997/98 Chair of the Dept. Graduate Admissions Committee
- 39. 1997/98 Member of the Dept. Graduate Program Committee
- 40. 1997 /98- Chair of the Dept. Crustal Seismologist Search Committee

SERVICE TO UNIVERSITY – UNIVERSITY OF MEMPHIS, CERI

- 1. 2000 Member of CERI Computer Committee
- 2. 2000 Member of CERI task force on Department of Earth Sciences Integration
- 3. 2001 Chair of CERI Curriculum Committee
- 4. 2001-2002 College Search Committee for Chair of DES
- 5. 2003 CERI EarthScope Committee
- 6. 2003-2008 Chair, Department of Earth Sciences (DES) Geophysics Graduate Committee
- 7. 2003-2004 DES Natural Hazards Graduate Committee
- 8. 2003 Chair CERI faculty evaluation committee
- 9. 2004 DES Undergraduate Committee
- 10. 2003-2005 Chair of the DES Tenure and Promotion Committee
- 11. 2004 CERI Field Deployment Committee
- 12. 2004-2005 CERI Reflection Seismology Search Committee

- 13. 2005-2006 CERI Research Professor Search Committee
- 14. 2005-2006 University Review Committee for Faculty Research Grants Competition
- 15. 2008-2022 Director of CERI
- 16. 2009 Member of the Dean's task force on the future of the College of Arts&Sciences
- 17. 2013-2014 Member of the University Task Force on Research Capacity
- 18. 2014 Member of the University Research Services Implementation Team
- 19. 2016 Member of Civil Engineering Chair Review Committee
- 20. 2018 Member of the University of Memphis Research Council
- 21. 2022 Member of the College of Arts and Sciences Promotion and Tenure Committee

UNDERGRADUATE TEACHING - PSU

- GSc 9 (3) Introduction to Geophysics
- GSc 203 (4) Physical Processes in Geology
- GSc 297H (3) Nuclear explosions: science and policy
- GSc 480 (3) Physics of the Earth

GSc 489 (3) Geophysics of the Basin and Range(Death Valley Field Trip Course)

- GSc 485 (3) Applied Seismology
- GSc 497B (3) Case Histories (Death Valley Field Trip Course)

GSc 497K (3) Multichannel Seismic Processing and Interpretation

GRADUATE TEACHING - PSU

Gphys 507A (3) Seismology

Gphys 507B (3) Advanced Seismology

Gphys 508 (3) Tectonics

GSc 514 (3) Data Inversion in the Geosciences

Gphys 597 (1) Seismogram Interpretation

GSc 597B (3) Case Histories (Death Valley Field Trip Course)

UNDERGRADUATE TEACHING - UM

GEOP 4701 (3) Spring Field Trip 2002

GRADUATE TEACHING - UM

GEOP 6701 (3) Spring Field Trip 2002
GEOP 6400 (3) Reflection Seismology
GEOP 7702 (3) Seminar in Seismology
GEOP 7402 (3) Earthquake Seismology (renamed Intermediate Seismology)
GEOP 7603/CERI 7603/8603 (3) Inverse Methods in Geophysics
GEOP 7112 (3) Advanced Geophysics
GEOP 7401/CERI 7105/8105 (3) Global Seismology