

Dr. Jonny Wu
Associate Professor
Department of Geosciences, University of Arizona, USA

Research Interests

Plate tectonics, structural geology, tectonics, geodynamics, energy and mineral exploration geoscience, circum-Pacific plate tectonic reconstructions

Academic and Industry Experience

Associate Professor Department of Geosciences University of Arizona, Arizona, USA	2023-present
Associate Professor Department of Earth and Atmospheric Sciences University of Houston, Texas, USA	2022-2023
Assistant Professor Department of Earth and Atmospheric Sciences University of Houston, Texas, USA	2016-2022
Postdoctoral Research Fellow (Advisor: Prof. John Suppe) Department of Geosciences, National Taiwan University	2011-2016
Exploration Geologist Shell Canada, Calgary, Canada	1998-2004

Education

Ph.D , Geology Royal Holloway University of London, UK Thesis: 4D evolution of deepwater fold-thrust belt, offshore NW Borneo, South China Sea (Advisor: Ken McClay)	2010
M.Sc with distinction , Basin Evolution and Dynamics Royal Holloway University of London, UK Thesis: 4D analogue modeling of transtensional pull-apart basins (Advisor: Ken McClay)	2005
B. Eng , Geological Engineering University of Waterloo, Canada	1998

Courses Taught

Tectonic Interpretation of Seismic Tomography, graduate class
Physical Sandbox Modeling of Structural Systems, graduate class
Physical Geology
Historical Geology
Petroleum Geoscience for Petroleum Engineers
Geological Field Methods

Selected Awarded Grants

NSF EAR-PF: Mantle Convection Modeling as a Test of Pacific Absolute Plate Motion, Postdoctoral Fellowship for Dr. Daniel Woodworth (scientific mentor/co-PI), \$180,000. Start 09/01/2022. End 09/01/2024.

NSF CAREER Award (sole PI): Unfolding Earth history back to the Mesozoic by incorporating seismic tomography into Pacific realm plate tectonic reconstructions, \$568,309. Start 04/01/2019; End 04/01/2023.

2020 AAPG Grants-in-Aid Foundation, Merrill W. Haas Memorial Grant. Detrital Zircon fieldwork, Tyaughton-Methow basin of British Columbia, Canada, for Ph.D. student Spencer Fuston, \$3,000.

NSF-funded virtual organization Extreme Science and Engineering Discovery Environment (XSEDE) Computing Allocations proposal: Testing Western North American Terrane Collisional Timing from Mantle Convection Forward Modeling, (co-PI), 385,776 supercomputing node hours (official in-kind value \$2,278,699.25). Start 01/01/2021. End 12/31/2021.

NSF HDR DSC: Data Science for Energy Transition (senior personnel), \$1,323,016 (\$44,321 share). Start 10/01/2021. End 10/01/2024.

Selected University Service

2025-present, U. Arizona, Associate Department Head
2023-present, U. Arizona, Colloquium/News and Accolades committee
2023-present, U. Arizona, Graduate Admissions committee

Selected Awards

University of Houston Presidential 50-in-5 "Impact50 Publication Honoree", 2021
Chinese Academy of Sciences, Presidential International Fellowship Initiative, 2021
University of Houston Presidential 50-in-5 "National Recognition Honoree, National Awards", 2019
NSF CAREER Award, 2019

Publications (* = advised graduate student)

1. Calvelage, C. *, Colli, L., Wu, J., Lin, Y.-A. *, Zheng, Y., Rahimzadeh Bajgiran, M. *, 2025. Effects of subduction history on True Polar Wander driven by perturbations of Earth's inertial moment from mantle convection, *Proceedings of the Royal Society A: Mathematical Physical and Engineering Sciences*, 481, 20240196. <https://doi.org/10.1098/rspa.2024.0196>
2. Wang, F., Wei, S.S., Ruppert, N.A., Zhang, H., Wu, J., 2025. Slab morphology, dehydration, and sub-arc melting beneath the Alaska Peninsula revealed by body-wave tomography, *Journal of Geophysical Research Solid Earth*, 130, e2024JB029814. <https://doi.org/10.1029/2024JB029814>
3. Zhao, Q., Yan, Y., Tonai, S., Dilek, Y., Carter, A., Clift, P., Wu, J., Sibuet, J.-C., Zhang, X., 2025. A newly identified 'Proto-Kenting Mvölange (S. Taiwan)' Represents a Missing Link for a continuous Early Cretaceous Paleo-Pacific Subduction-Accretion System, *Tectonics*, 44, e2024TC008456. <https://doi.org/10.1029/2024TC008456>
4. Fuston, S. *, Colli, L., Wu, J., accepted. Cretaceous collision reconciles western North American tectonics with deep mantle slabs, in, Gordon, S., Tikoff, B., Rusmore, M., Miller, B., eds., *GSA Special Paper "Jurassic-Paleogene tectonic evolution of the North American Cordillera"*.
5. Fuston, S. *, Wu, J., Colli, L., accepted. A discussion of uncertainty in North American plate tectonic reconstructions from lower mantle slabs, in, Gordon, S., Tikoff, B., Rusmore, M., Miller, B., eds., *GSA Special Paper "Jurassic-Paleogene tectonic evolution of the North American Cordillera"*.
6. Chen, Y.W., Wu, J., Bunge, H.-P., Stotz, I., Robl, G., Schuberth, B., accepted. Tomopac2: an unfolded-slab plate reconstruction validated via mantle circulation models in a closed-loop experiment. *Proceedings of the Royal Society A: Mathematical Physical and Engineering Sciences*.
7. Ribeiro, J., Ryan, J., Wu, J., 2025. Can hot and cold slabs transport volatiles into the deep mantle beyond subduction zone magmatism? *Geochemistry, Geophysics, Geosystems*, 26, e2024GC011694. <https://doi.org/10.1029/2024GC011694>
8. Li, A., Tao, Z., Wu, J., Fischer, K., 2024. Revealing the Cape Verde hotspot track across the Great Lakes, *Geophysical Research Letters*. <https://doi.org/10.1029/2024GL110777>
9. Humphreys, E., Clennett, E., Wu, J., Van Buer, N., accepted. Reconciling Baja-BC and flat Shatsky conjugate subduction beneath the western U.S., in, Gordon, S., Tikoff, B., Rusmore, M., Miller, B., eds., *GSA Special Paper "Jurassic-Paleogene tectonic evolution of the North American Cordillera"*.
10. Yilmaz, Ö., Özer, Z. Beşevli, D. T., Wu, J., Özsoy, C., Sevinç, S., Bakioglu, K. B., Ercengiz, M. B., Şahin, Ö. K., Dadak, B., Hastürk, T., Yapar, Ö., Sipahioglu, N. Ö., Demirci, C., Temel, R. Ö., Akalın, M. F., Sadioglu, M. S. B., 2025. 3-D Seismic Delineation of the North Anatolian Fault System Shear Zone in the Western Half of Marmara Basin, Türkiye. *Tectonophysics*, 905, 230726. <https://doi.org/10.1016/j.tecto.2025.230726>
11. Calvelage, C. *, Wu, J., Colli, L., Lin, Y.-A. *, Zheng, Y., 2024. Linking deep-time subduction history to modern day expressions of dynamic topography, *Proceedings*

- of the Royal Society A: Mathematical Physical and Engineering Sciences, 480, 2301, <https://doi.org/10.1098/rspa.2024.0254>
12. Sibuet, J.C., Liu, S., Zhao, M., Wu, W., Wu, Y.-M., Cheng, J., Wu, J., 2024, A revolution in understanding SE Asia geodynamics since 20.5-18 Ma, Tectonophysics, 884 <https://doi.org/10.1016/j.tecto.2024.230397>
 13. Rao, G., Chen, W., Yan, D.-P., Tian, Y., Deng, B., Luo, G., Wu, J., 2024. Editorial: Lithosphere and Surface Processes of the Sichuan Basin and Surrounding Areas: Resources and Environmental Effects, Frontiers in Earth Science, <https://doi.org/10.3389/feart.2024.1435918>
 14. Ding, W., Huang, X., Zhao, L., Wu, J., Dimalanta, C., Pubellier, M., Wang, F., Dynamic processes of the Southeast (SE) Asia convergent system and its impact on continental deformation and marginal basin formation: Preface, Tectonophysics, <https://doi.org/10.1016/j.tecto.2024.230314>
 15. Zhang, R., Zhang, B., Zhu, H., Sibuet, J.C., Briais, A., Wu, J., Susilohadi, S., Zeng, H., Chen, J., Zhong, G., Introduction to special section: South China Sea deep structures and tectonics, SEG Interpretation, 12, 2, <https://doi.org/10.1190/int-2024-0307-spseintro.1>
 16. Qian, S., Wu, J.-T.*, Wu, J., Philippine Sea plate and surrounding magmatism reveal the Antarctic-Zealandia, Pacific, and Indian mantle domain boundaries, accepted, Nature Communications Earth and Environment, 5, 183, <https://doi.org/10.1038/s43247-024-01326-6>
 17. Liao, J., Lu, Z., Huangfu P., Xu, T., Zhao, L., Zhong, S., Wu, J., 2024. Editorial: Episodic Plate Destruction and Construction in Southeast Asia: Observations, Modeling, and Case Studies, Frontiers in Earth Sciences, 12, 1393757, <https://doi.org/10.3389/feart.2024.1393757>
 18. Chen, Y.-W.*, Wu, J., Goes, S., 2024. Lesser Antilles slab reconstruction reveals lateral slab transport under the Caribbean since 50 Ma, Earth and Planetary Science Letters, 627, 118561, <https://doi.org/10.1016/j.epsl.2023.118561>
 19. Wu., J., Wu, J.-T., Yamaoka, K., 2024. Linking Pacific plate motions to metamorphism and magmatism in Japan during Cretaceous to Paleogene times, in "in "Metamorphic Duality in SW Japan - The Sanbagawa-Ryoke Classic Example of Paired Metamorphism", Elements, 20, 2, 103-109, <https://doi.org/10.2138/gselements.20.2.103>
 20. Rahimzadeh Bajgiran, M.*, Colli, L., **Wu, J.**, 2023, Assessing large-scale mantle compositional heterogeneity from machine learning analysis of 28 global P- and S-wave tomography models, Geophysical Journal International, <https://doi.org/10.1093/gji/ggad373>
 21. Zhou, Y., Carter, A., **Wu, J.**, Liu, H., Yan, Y., Zhu, Z., Liu, W., Zhao, Q., Liu Q, 2023, Nature of Paleo-Pacific subduction along the East Asian continental margin: Insights from the sedimentary record of West Sarawak, Borneo, Geophysical Research Letters, 50, e2022GL102370, <https://doi.org/10.1029/2022GL102370>
 22. Zhang, J., Zhang, G.-L., **Wu, J.**, 2023. Geochemical and geochronological constraints for the tectonic and magmatic evolution of the SW Mariana subduction zone. Deep Sea Research Part 1: Oceanographic Research Papers, <https://doi.org/10.1016/j.dsr.2023.104039>

23. Lin, Y.A.* , Colli, L., **Wu, J.**, 2022. NW Pacific-Panthalassa intra-oceanic subduction during Mesozoic times from mantle convection and geoid models, *Geochemistry, Geophysics, Geosystems*, 23, e2022GC010514, <https://doi.org/10.1029/2022GC010514>
24. Wu, T.-J.* , **Wu, J.**, Alexandrov, I., Lapen, T., Lee, H.-Y., Ivin, V., 2022. Continental growth during migrating arc magmatism and terrane accretion at Sikhote-Alin (Russian Far East) and adjacent northeast Asia, *Lithos*, 432-433. <https://doi.org/10.1016/j.lithos.2022.106891>
25. Qian, S.-P., Salters, V.J.M., McCoy-West, A. J., **Wu, J.**, Rose-Kogam E.F., Nichols, A., Zhang, L., Zhou, H., 2022. Highly heterogeneous mantle caused by recycling of oceanic lithosphere from the mantle transition zone, *Earth and Planetary Science Letters*, 593, 117679. <https://doi.org/10.1016/j.epsl.2022.117679>
26. **Wu, J.**, Lin, Y.-A.* , Flament, N., Wu, T.-S.* , Liu, Y, 2022. Northwest Pacific-Izanagi plate tectonics since Cretaceous times from imaged and predicted mantle structure, *Earth and Planetary Science Letters*, 583, 117445. <https://doi.org/10.1016/j.epsl.2022.117445>
27. Wu, J. T.-J.* , **Wu, J.**, Okamoto, K., 2022. Intra-oceanic arc accretion along northeast Asia during Early Cretaceous provides a plate tectonic context for North China craton destruction, *Earth Science Reviews*, 226, 103952. <https://doi.org/10.1016/j.earscirev.2022.103952>
28. Rao, G., Lu, R., Le Beon, M., Delcaillau, B., **Wu, J.**, Graveleau, F., 2021. Editorial: Active Fold-and-Thrust Belts: From Present-Day Deformation to Structural Architecture and Modelling. *Frontiers in Earth Science*. <https://doi.org/10.3389/feart.2021.816157>
29. Sibuet, J.C., Zhao, M., **Wu, J.**, Lee, C.-S., 2021. Geodynamic and kinematic context of South China Sea subduction during Okinawa trough opening and Taiwan orogeny, *Tectonophysics*, <https://doi.org/10.1016/j.tecto.2021.229050>
30. Qian, S.-P., Zhang, X., **Wu, J.**, Lallemand, S., Nichols, A., Huang, C.-Y., Miggins, D.P., Zhou, H., 2021. First identification of a Cathaysian continental fragment beneath the Gagua Ridge, Philippine Sea, and its tectonic implications, *Geology*, <https://doi.org/10.1130/G48956.1>
31. Amonpantang, P.* , **Wu, J.**, 2021. Structural characterization of the Phitsanulok basin, onshore Thailand, and regional tectonic implications, *Marine and Petroleum Geology* <https://doi.org/10.1016/j.marpetgeo.2021.105110>
32. Ward. J., Rosenbaum, G., Ubide, T., **Wu, J.**, Caulfield, J., Sandiford, M., Güre, D., 2021. Geophysical and geochemical constraints on the formation of Holocene intraplate volcanism in East Asia, *Earth Science Reviews*, 218. <https://doi.org/10.1016/j.earscirev.2021.103624>
33. Hussein, M., Stewart, R., Sacrey, D., Johnston, D.H., **Wu, J.**, 2021, Unsupervised machine learning for time-lapse seismic studies and reservoir monitoring, *SEG Interpretation*. <https://doi.org/10.1190/int-2020-0176.1>
34. Chen, Y.-W.* , Colli, L., Bird, D.E., **Wu, J.**, Zhu, H., 2021, Caribbean plate tilted and actively dragged eastwards by low viscosity asthenospheric flow, *Nature Communications*, 12, 1603. <https://doi.org/10.1038/s41467-021-21723-1>
35. Hussein, M., Stewart, R., Sacrey, D., **Wu, J.**, Athale, R., 2021. Unsupervised machine learning using 3D seismic data applied to reservoir evaluation and rock type

- p>identification,
- SEG Interpretation*
- , 9(2), T549-T568
- <https://doi.org/10.1190/int-2020-0108.1>
36. Hussein, M., Stewart, R., **Wu, J.**, 2021. Which seismic attributes are best for subtle fault detection?, *SEG Interpretation*, 9(2), T299-T314. <https://doi.org/10.1190/int-2020-0068.1>
 37. Fuston, S.* , **Wu, J.**, 2021. Raising the Resurrection plate from an unfolded-slab plate tectonic reconstruction of northwestern North America since early Cenozoic time, *GSA Bulletin*, 133 (5-6), 1128-1140. <https://doi.org/10.1130/B35677.1>
 38. Lin, Y.A.* , Colli, L., **Wu, J.**, Schubert, B., 2020. Where are the proto-South China Sea slabs? SE Asian plate tectonics and mantle flow history from global mantle convection modeling, *Journal of Geophysical Research Solid Earth*, 125,12. <https://doi.org/10.1029/2020JB019758>
 39. **Wu, J.**, McClay, K.R., De Vera, J. 2020. Growth of triangle zone fold-thrusts within the NW Borneo deepwater fold belt, offshore Sabah, southern South China Sea. *Geosphere*, <https://doi.org/10.1130/GES02106.1>
 40. Li, L. and **Chen, Y-W.***, Zheng, Y., Hu, H., **Wu, J.**, 2019. Seismic Evidence for Plume-Slab Interaction by High-resolution Imaging of the 410-km Discontinuity Under Tonga, *Geophysical Research Letters*, 46, 13687-13694. <https://doi.org/10.1029/2019GL084164>
 41. Zhao, M., Sibuet, J.C., **Wu, J.**, 2019. The South China Sea and Philippine Sea plate intermingled fates, *National Science Review*, 6, 5, 886-890. <https://doi.org/10.1093/nsr/nwz107>
 42. Wu, J.T-S.* , **Wu, J.**, 2019. Izanagi-Pacific ridge subduction revealed by a 56 to 46 Ma magmatic gap along the NE Asian margin, *Geology*, 47, 10, 953-957. <https://doi.org/10.1130/G46778.1>
 43. Amonpantang, P.* , Bedle, H., **Wu, J.**, 2019, Multi-attribute analysis for channel element discrimination in the Taranaki basin, New Zealand, *SEG Interpretation*, 7, 2 SBi-T563. <https://doi.org/10.1190/INT-2018-0174.1>
 44. Chen, Y.-W.* , **Wu, J.**, Suppe, J., 2019. Southward propagation of Nazca subduction along the Andes. *Nature*, 565, 441-447. <https://doi.org/10.1038/s41586-018-0860-1>
 45. Liu, S., Zhao, M., Sibuet, J.C., Qiu, X., Zhang, J., **Wu, J.E.**, Chen, C., Xu, Y., Sun, L., 2018. Geophysical constraints on the lithospheric structure in the northeastern South China Sea and its implications for the South China Sea geodynamics, *Tectonophysics*, 742-743, 101-119. <https://doi.org/10.1016/j.tecto.2018.06.002>
 46. **Wu, J.**, Suppe, J., 2018. Proto-South China Sea plate tectonics using subducted slab constraints from tomography. *Journal of Earth Science*, 29, 6, 1304-1318, <https://doi.org/10.1007/s12583-017-0813-x>
 47. **Wu, J.E.**, Suppe, J., Lu, R., Kanda, R.V.S., 2016. Philippine Sea and East Asian plate tectonics since 52 Ma constrained by new subducted slab reconstruction methods. *Journal of Geophysical Research Solid Earth*, 121, 6, 4670-4741. <https://doi.org/10.1002/2016JB012923>
 48. **Wu, J.E.**, McClay, K.R., Frankowicz, E., 2015. Niger Delta gravity-driven deformation above the relict Chain and Charcot oceanic fracture zones, Gulf of Guinea: insights from analogue models. *Marine and Petroleum Geology*, 65, 43-62. <https://doi.org/10.1016/j.marpetgeo.2015.03.008>

49. Sukan, M., **Wu, J.E.**, and McClay, K.R., 2014. 3D analogue modelling of transtensional pull-apart basins: comparison to the Cinarcik Basin, Marmara Sea, Turkey, *Bollettino di Geofisica Teorica e Applicata*, 55, 4, 699-716.
<https://doi.org/10.4430/bgta0129>
50. Lu, R., He, D., Suppe, J., **Wu, J.E.**, Liu, B., Chen, Y.G., 2014. Structural model of the central Longmen Shan thrusts using seismic reflection profiles: Implications for the sediments and deformations since the Mesozoic. *Tectonophysics*, 630, 43-53.
<https://doi.org/10.1016/j.tecto.2014.05.003>
51. **Wu, J.E.**, McClay, K.R., Whitehouse, P., Dooley, T., 2012. Chapter 25: 4D analogue modelling of transtensional pull-apart basins. In: Bally, A.W. and Roberts, D.G. eds., *Phanerozoic Regional Geology of the World*, Vol. 1, Elsevier, 675 pp.
52. **Wu, J.E.**, McClay, K.R., 2011. Chapter 14: 2D analog modeling of fold and thrust belts: dynamic interactions with syn-contractual sedimentation and erosion, in: K. McClay, J. H. Shaw and J. Suppe, eds., *Thrust Fault-Related Folding*, American Association of Petroleum Geologists Memoir 94.
<https://doi.org/10.1306/13251343M9450>
53. **Wu, J.E.**, McClay, K.R., Despinois, F., Woollard, M., Evans, R., Isa, L., Janai, S., 2010. Analogue modelling of deepwater fold and thrust belts: Dynamic interaction with syntectonic sedimentation. *Trabajos de Geologia*, 30, 331-336.
54. **Wu, J.E.**, McClay, K.R., Whitehouse, P., Dooley, T., 2009. 4D Analogue Modelling of Transtensional Pull-Apart Basins, *Marine and Petroleum Geology*, 26, 8, 1608-1623.
<https://doi.org/10.1016/j.marpetgeo.2008.06.007>