Dr. Jonny Wu

Assistant Professor,
Structural Geology, Tectonics and Mantle Structure
Department of Earth and Atmospheric Science, University of Houston, USA

Education

Royal Holloway University of London UK 2006-2010
Ph.D, Geology, Department of Earth Sciences
Thesis: 4D evolution of deepwater fold-thrust belt, offshore NW Borneo, South China Sea
Advisor: Ken McClay

Royal Holloway University of London UK 2004-2005
M.Sc, Basin Evolution and Dynamics, Department of Earth Sciences
Thesis: 4D analogue modeling of transtensional pull-apart basins
Advisor: Ken McClay

University of Waterloo, Canada 1993-1998
B. Eng, Geological Engineering

Research Interests

- Global plate tectonics and subduction zones using mantle constraints
- East Asian plate tectonics, geology, geodynamics
- 4D structural evolution of sedimentary basins and fault systems
- Petroleum and energy geoscience

Academic and Industry Experience

Assistant Professor 2016-present
Department of Earth and Atmospheric Sciences
University of Houston, Texas

Postdoctoral Research Fellow 2011-2016
Department of Geosciences, National Taiwan University
Advisor: Prof. John Suppe

Analogue Model Laboratory Graduate Research Assistant 2005-2006
Fault Dynamics Research Group, Royal Holloway UK
Advisor: Prof. Ken McClay

Exploration Geologist 1998-2004
Shell Canada, Calgary, Canada

Publications (* = advised graduate student)

1. **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

2. 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

3. 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

4. Sibuet, J.C., Zhao, M., **Wu, J.,** Lee, C.-S., accepted. 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

5. Qian, S.-P., Zhang, X., **Wu, J.**, Lallemand, S., Nichols, A., Huang, C.-Y., Miggins, D.P., Zhou, H., in press. 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

6. Amonpantang, P.*, **Wu, J.,** accepted. 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

7. Ward. J., Rosenbaum, G., Ubide, T., **Wu, J.,** Caulfield, J., Sandiford, M., Gürer, D., accepted. 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

8. Hussein, M., Stewart, R., Sacrey, D., Johnston, D.H., **Wu, J.**, accepted, Unsupervised machine learning for time-lapse seismic studies and reservoir monitoring, *SEG Interpretation.* https://doi.org/10.1190/int-2020-0176.1

9. Chen, Y.-W.*, Colli, L., Bird, D.E., **Wu., J.,** Zhu, H., Caribbean plate tilted and actively dragged eastwards by low viscosity asthenospheric flow, 2021, *Nature Communications,* 12, 1603. https://doi.org/10.1038/s41467-021-21723-1

10. 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 identification, *SEG Interpretation,* 9(2), T549-T568 https://doi.org/10.1190/int-2020-0108.1

11. 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

12. 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

13. 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

14. **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

15. 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

16. 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

17. 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

18. 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. doi: 10.1190/int-2018-0174.1.

19. Chen, Y.-W.*, **Wu, J.,** Suppe, J., 2019. Southward propagation of Nazca subduction along the Andes. Nature, 565, 441-447. doi: 10.1190/int-2018-0174.1.

20. 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 doi: 10.1016/j.tecto.2018.06.002.

21. **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, doi: 10.1007/s12583-017-0813-x.

22. **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. doi: 10.1002/2016JB012923

23. **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.

24. Sugan, 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.

25. 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.

26. **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.

27. **Wu, J.E**., McClay, K.R., 2011. Chapter 14: 2D analog modeling of fold and thrust belts: dynamic interactions with syn-contractional sedimentation and erosion, in: K. McClay, J. H. Shaw and J. Suppe, eds., Thrust Fault-Related Folding, American Association of Petroleum Geologists Memoir 94.

28. **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.

29. **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.

Courses Taught

GEOL1330: Physical Geology
GEOL4386: Petroleum Geoscience for Petroleum Engineers
GEOL7332: Tectonic Interpretation of Seismic Tomography (graduate class)
GEOL3340: Geological Field Methods
GEOL6497: Physical Sandbox Modeling of Structural Systems (graduate class)

Awarded Grants

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. Fieldwork in Tyaughton-Methow basin of British Columbia 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.