Qiqi Wang

Professional Summary

Fall 2022

Business address: The University of Texas at Austin
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Google Scholar: https://scholar.google.com/citations?user=Hlc4hKcAAAAJ&hl=en

Academic Background

Ph.D. Geological Sciences, The University of Texas at Austin
M.S. Statistics, The University of Texas at Austin, 2021
M.S. Geological Sciences, The University of Texas at Austin, 2016
B.S. Geology and Geophysics, China University of Petroleum joint with Missouri University of Science & Technology, 2014

Industry Experience

Earth Science Intern, Chevron CTC 05/2021-08/2021

- Conducted cross-disciplinary reservoir quality research within Chevron Technology Center, in conjunction with Rockies business unit (previously Noble Energy)
- Utilized analytical skills to conduct reservoir quality & fracture characterization of chalk & marl systems of Niobrara Fm., integrating vertical & horizontal wellbore datasets to identify a correlation between rock facies & fracture density
- Constructed fracture density trend model in *Petrel*, leveraging structural & stratigraphic controls, to guide discrete fracture network models (DFN) in completion strategy optimization

Upstream Reservoir Quality (RQ) Geologist intern, BP America 06/2020-08/2020

- Optimized reservoir quality evaluation workflow including advanced data analytics methods to achieve better efficiency & new capabilities: built RQ database, characterized rock property trends & variations with original RQ data analytics workflow, developed porosity & permeability prediction models using *Touchstone*^{TM} for a new EGOM offshore prospect
- Designed & implemented unsupervised machine learning method for dimension reduction in exploring intrinsic variability of massive rock data
- Developed & implemented a reservoir quality data analytics template in *Spotfire* with algorithms written in *R*, allowing a smooth learning curve for others to adopt workflow

Geology Intern, Ascent Energy Service 06/2014-08/2014

- Conducted formation evaluation of Ordovician carbonates, porosity characterization along faults, fractures & dissolution cavities, Junggar Basin, NW China
- Interpreted origin of seismic beads on 3D seismic in karst & active tectonic setting & assessed their relationship with bit drops

- Helped optimize production while reducing drilling hazards & risks

Other Professional Experience

Graduate Statistical Consultant, UT Austin 08/2021-12/2021
Clients: IC2 Institute (Matt Kammer-Kerwick, Jeffrey Sternberg, Kara Takasaki)

- Researched community preferences in rural Texas. Applied conjoint analysis with mixed effect to detect most influential factors on communities facing relocation. Paper in press.

Lab assistant/Interim lab manager, Electron Micro-Beam Lab, UT Austin 02/2017-08/2017

- Managed Scanning Electron Microscopes (SEM/SEM-CL, ESEM) & X-ray diffraction instruments in DGS Jackson School E-beam lab. Interpreted images, maintained instruments, trained internal & external users

Field team member & workshop, BEG - YPF Petroleum, Argentina 03/2015

- Collected & analyzed field data as part of a field team of eighteen geologists & geophysicists for two-weeks, Neuquén Basin, Argentina. Manuscript in preparation.

Graduate Research Assistant, Bureau of Economic Geology 08/2014-present

- Field work in Argentina, Wyoming, Utah, Texas, New York, core & log analysis, & laboratory work on fractured shale, sandstone & basement rock
- Helped develop fracture spatial analysis software including data interpretation protocols & preparation of User's Manual; organized & taught short course on methods & interpretation. In preparation for publication
- Conducted joint studies with researchers involved in tight sandstone, fractured carbonate, & geothermal research in western China in support of UT FRAC initiatives. Numerous publications based on contributions to fracture and statistical analysis & SEM image collection & interpretation

Key Training and Short Course Experience
Fluid and Melt Inclusions: Applications to Geologic Processes - Mineralogical Association of Canada
Geothermal 101 - AAPG | BEG Geosciences Technology Workshop
Rock properties modelling from 2-D images - AAPG Short course
Fundamentals of *Touchstone* & *T>Map* – Geocosm, Houston, U.S. and Erlangen, Germany
1st School of Sandstone Diagenesis - FAU and Geocosm, Erlangen, Germany

Leadership

Session chair, IMAGE, AAPG & SEG annual meeting	09/2021
Student Representative, GSA Energy Geology Division	2019-present
Vice President, UT AAPG Student Chapter	2020-present
Secretary & Event Organizer, ARMA UT Austin Student Chapter	2019-present

Honors and Awards

First author, 'Best of Petroleum Geoscience', Geological Society of London	2021
Jackson School Research Fund	2018, 2019, 2020, 2021
AAPG Award of Excellence "Top 10" Poster Presentation	2015
Spring Undergraduate Research Award	2013
S.K. Grant Field Camp Award, best mapper	2013

Invited Talk

'Understanding Fractures and Reservoir Quality in Tight Sandstones – Coupled Effects of Diagenesis and Deformation', AAPG Petroleum Structure and Geomechanics Division, September 2021

Software and Coding

Coding: R, Python – experience with statistical analysis & basic machine learning packages
Data Management: SQL coding and Microsoft Access for database management
Software: *Petrel*, *Touchstone* & software suite (Geocosm), TIBCO *Spotfire*, *J-Microvision*, *CorrCount*

Publications

In press

Sternberg, J., Kammer-Kerwick, M., **Wang, Q.**, Liu, Z., Takasaki, K., 2022. Move or not to move? A conjoint analysis on community preferences in rural Texas. *Rural Sociology.*

In preparation

Wang, Q., Narr, W., Laubach, S.E., Quantitative characterization of fracture spatial arrangement and intensity in a reservoir anticline using horizontal wellbore image logs and an outcrop analogue. *Journal of Petroleum Science and Engineering*. Submission anticipated December 2022.
Dissertation chapter 3.

Wang, Q., Gale, J.F.W., Characterization of bedding-parallel fractures in shale: morphology, size scaling and spatial distribution – Marcellus, Wolfcamp and Vaca Muerta examples. *Marine & Petroleum Geology*. Submission anticipated January 2023.

Wang, Q., Laubach, S.E., Lander, R., and Bonnell, L., Progressive diagenesis, mechanical, and fracture stratigraphy: Unravelling the causes of fracture intensity variation in a passive margin basin. *Geological Society of America Bulletin.* Submission anticipated March 2023
Dissertation chapter 4.

Peer reviewed and Conference Papers

Corrêa, R.S., Ukar, E., Laubach, S.E., Aubert, I., Lamarche, J., **Wang, Q.**, Stockli, D.F., Stockli, L.D. and Larson, T.E., 2022. Episodic reactivation of carbonate fault zones with implications for permeability–An example from Provence, Southeast France. *Marine and Petroleum Geology*, 145, 105905.

Yu, J., Shi, K., **Wang, Q.**, Liu, B., Han, J., Song, Y., Kong, Y. and Jiang, W., 2022. Structural diagenesis of deep carbonate rocks controlled by intra-cratonic strike-slip faulting: An example in the Shunbei area of the Tarim Basin, NW China. *Basin Research*, 34(5), 1601-1631.

Zeng, L., Gong, L., Guan, C., Zhang, B., **Wang, Q**., Zeng, Q. and Lyu, W., 2022. Natural fractures and their contribution to tight gas conglomerate reservoirs: A case study in the northwestern Sichuan Basin, China. *Journal of Petroleum Science and Engineering*, 210, 110028.

Yu, J., Song, Y., Shi, K., Chen, S., **Wang, Q**., Liu, B. and Han, J., 2022. Depositional facies and sequence architecture of the Yijianfang Formation in the Shuntuoguole Low Uplift, Tarim Basin, NW China. *Geological Journal*. 57(8), 33135-3157.

Wang, S., Wang, G., Li, D., Wu, X., Chen, X., **Wang, Q.**, Cao, J. and Zhang, Y., 2022. Comparison between double caliper, imaging logs, and array sonic log for determining the in-situ stress direction: A case study from the ultra-deep fractured tight sandstone reservoirs, the Cretaceous Bashijiqike

Formation in Keshen8 region of Kuqa depression, Tarim Basin, China. *Petroleum Science*, doi.org/10.1016/j.petsci.2022.08.035

Wang, J., Zeng, L., Yang, X., Liu, C., Wang, K., Zhang, R., Chen, X., Qu, Y., Laubach, S.E. and **Wang, Q.**, 2021. Fold-related fracture distribution in Neogene, Triassic, and Jurassic sandstone outcrops, northern margin of the Tarim Basin, China: guides to deformation in ultradeep tight sandstone reservoirs. *Lithosphere*, Special 1, 833-561.

Wang, Q., Narr, W. and Laubach, S.E., 2020. Characterizing subsurface fracture spatial distribution in the East Painter Reservoir Anticline, Wyoming. *Unconventional Resources Technology Conference (URTEC)*, URTeC-3265, 12 p. doi: 10.15530/urtec-2020-3265 (Conference paper)

Liu, G., Zeng, L., Han, C., Ostadhassan, M., Lyu, W., **Wang, Q.**, Zhu, J., Hou, F., 2020. Natural fractures in carbonate basement reservoirs of the Jizhong Sub-Basin, Bohai Bay Basin, China: Key aspects favoring oil production. *Energies*, 13, 4635.

Yin, Y., Qu, Z.G. Zhang, T. Zhang, J.F. and **Wang Q.**, 2020. Three-dimensional pore-scale study of methane gas mass diffusion in shale with spatially heterogeneous and anisotropic features. *Fuel* 273, 117750.

Wang, Q., Laubach, S.E., Gale, J.F.W., and Ramos, M., 2019. Quantified fracture (joint) clustering in Archean basement, Wyoming: Application of Normalized Correlation Count method. *Petroleum Geosciences* 25, 415-428. doi:10.1144/petgeo2018-146 (journal's 3rd most read and downloaded paper 2019, 'Best of Recent Paper' recognition by Geological Society of London)
Dissertation chapter 2.

Wang, Q., Laubach, S.E., and Fall, A., 2019. Coupled effects of diagenesis and deformation on fracture evolution in deeply buried sandstones. *53rd American Rock Mechanics Association symposium*. 23-26 June, New York, NY, ARMA 2019-1842. Conference paper.
Dissertation chapter 1.

Dong, R., **Wang, Q.** and Wheeler, M.F., 2019. Prediction of mechanical stability of acidizing-induced wormholes through coupled hydro-chemo-mechanical simulation. *In 53rd US Rock Mechanics/Geomechanics Symposium*. OnePetro.

Wang, Q. and Laubach, S.E., 2018. Unraveling the history of ultra-deep fractures in sedimentary basins. *Pan-American Current Research on Fluid Inclusions* 2018. (Short paper)

Abstracts

Wang, Q. and Gale, J.F.W., 2016. Characterizing bedding-parallel fractures in shale: aperture-size distributions and spatial organization (abs.): *AAPG Annual Meeting*, June

Gale, J.F.W., Ukar, E., Elliott, S., and **Wang, Q.**, 2015. Bedding-parallel fractures in shales: characterization, prediction, and importance (abs.): *AAPG Annual Meeting*, June

Dissertation

Spatial arrangement of fractures in the context of diagenesis, expected Spring 2023

MS thesis

Wang, Q., 2016. Characterization of bedding-parallel fractures in shale: Morphology, size distribution and spatial organization.

Professional Narrative

Research Wang's research includes fundamental work on fracture pattern formation, methods to analysis patterns, clastic diagenesis, reservoir characterization, rock properties evaluation, and reservoir quality predictive modelling. Wang has expertise in petrography, scanning electron microscopy, fluid inclusion micro thermometry, field- and core-based fracture description, image log analysis, diagenetic and rock physics modeling (Touchstone), and integrated statistics and machine learning techniques.

Publications Wang's work has been published in the journals *Petroleum Geosciences*, *Lithosphere*, *Fuel*, and *Energies* as well as in proceedings of the Unconventional Resources Technology Conference (URTeC), and US Rock Mechanics/Geomechanics Symposium (ARMA). Her co-authors include faculty members, researchers and industrial personnel from US, China, and Europe. Wang's work has been cited by researchers from eight countries, including US, China, Italy, France, Great Britain, India, Mexico, and Japan. Wang's *Petroleum Geosciences* paper was recognized by the journal as the 'Best of Petroleum Geoscience' and the journal's No. 3 'Most downloaded' paper in 2019 according to publisher. She gave an invited talk at AAPG Petroleum Structure and Geomechanics Division in September 2021. She has also presented her work annual since 2018 to the Fracture Research and Application Consortium industrial sponsors and has presented short courses on fracture pattern analysis to this group and to faculty and staff of Cornell University in connection with their geothermal project.

Professional service Wang currently serves as vice president for UT AAPG student chapter, student representative for GSA Energy Geology Division, and secretary for UT ARMA student chapter.

Wang is a Guest Editor of the Journal of Structural Geology's Deep Basin Brittle Deformation special issue, 2022.

Wang was a Session Chair for the SEG - AAPG International Meeting for Applied Geosciences & Energy (IMAGE) Online Oral session Theme 4: *Fractures from Field Observations to Numerical Models* in Denver, Colorado, 2021. She served as an abstract and/or manuscript reviewer for journals and conferences proceedings, including reviews for *AAPG Bulletin*, *Journal of Structural Geology*, *Marine and Petroleum Geology*, *Geological Magazine*, *Journal of Applied Geophysics*, & AAPG conferences, among others.

BEG Service As a BEG research assistant and a Mandarin speaker, Wang is the principal liaison with delegations of visiting Chinese scientists including sponsors of FRAC. Activities included training in various analytical methods, project report material translation, meeting translation, and grant proposal translation for BEG collaborations with PetroChina (through FRAC and RCRL) as well as helping guide research by two visiting scientists from China who each spent a year in the FRAC group.

Career Goals Wang's goals include conducting fundamental and practical research at the interface between structural geology and sedimentary petrology with a focus on solving societally important challenges to hydrocarbon, geothermal and CCUS development in an international research organization that features cross-disciplinary collaborative research teams and international collaborations. A near-term goal is to acquire expertise in basin modeling.