DAVID JIAWEI TU

Research Scientist | **CARBON SOLUTIONS LLC**

PROFILE

Dr. David Jiawei Tu is a Research Scientist at Carbon Solutions focusing on numerical modeling and simulation of subsurface fluid transportation within porous media. He specializes in modeling and simulating CO_2 flows in subsurface reservoirs with comprehensive rock-flid properties description and PVT phase behaviors. In addition, Dr. Tu is experience in · engineering megaton-scale GHG and hydrogen geologic storage projects with numerical modeling and simulation; preparing and filing UIC Class VI well permits, Class II well permits, and MRV plans with EPA or State Permitting Agencies to procure Q45 tax incentive qualifications for DOE projects and private clients; well-informed with the current status and changes of CCUS-related regulations, legislation, and permitting process in the United States.

CONTACT

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EDUCATION & TRAINING

Ph.D. | Reservoir Engineering | Texas Tech University (TTU)
2017–2021

M.Sc. | Petroleum Engineering | Texas Tech University (TTU)
2016–2017

B.Sc. | Petroleum Engineering | Xi'an Shiyou University
2012–2016 |

PROFESSIONAL EXPERIENCE

Research Scientist | CARBON SOLUTIONS LLC, Houston, TX | 2024–Present

Research Associate III | New Mexico Institute of Mining and Technology (NMT)
Petroleum Recovery Research Center (PRRC)
Socorro, NM| 2021–2024

- *Designed and optimized geologic model of megaton CO2 Subsurface Storage in Saline Reservoirs in San Juan Basin. Evaluated the basin-wide potential of carbon storage with multiple storage sites and development strategies.*
- *Experienced in reservoir modeling and simulation to delineate Area of Review (AoR) and Corrective Action, Post-Site Care Plan (PISC) in support of EPA UIC Class VI carbon sequestration injection well permit application; Treated Acid Gas (TAG) injection in support of UIC Class II oil and gas waste disposal well application of the authorization to inject in New Mexico and Texas; EPA Subpart R.R. Monitoring, Reporting, and Verification (MRV) Plan for 45Q tax incentive.*
- *Testified regularly before the New Mexico Oil Conservation Commission at the New Mexico State Capitol as an expert witness in reservoir engineering and simulation in support of GHG sequestration.*

Research Fellow &Teaching Assistant | Texas Tech University
Lubbock, TX| 2017– 2020

- *Focusing on the Investigation of Enhanced Oil Recovery through Fracturing Fluid Imbibition in Unconventional Oil Reservoirs.*
- *Developed core and reservoir scale numerical models to optimize EOR application for shale oil reservoirs with CMG-STARS.*
- *Designed Cyclic Injection (CI), Forced Imbibition (FI), and Spontaneous Imbibition (SI) experimental set-up for surfactant assisted EOR in shale.*
- *Numerically and experimentally simulated and demonstrated that surfactant with wettability alteration and High IFT enhances unconventional oil production during the hydraulic fracturing stage in shale oil reservoirs.*

Frac Engineer Intern | ProPetro Services Inc., Midland, TX| 2019

- *Analyzed operational procedures for clients.*
- *Troubleshoot failures in fracturing systems such as pump failure, water supply failure, and chemical errors.*

SELECTED PUBLICATIONS

1. **Tu, J.** (**2019**). Study of Surfactant-based Shale Oil EOR Under High Confining Pressure Conditions. In **SPE Annual Technical Conference and Exhibition**. Society of Petroleum Engineers (SPE).

2. **Tu, J.**, and Sheng, J. (**2020**) Experimental and Numerical Study of Surfactant Solution Spontaneous Imbibition in Shale Oil Reservoirs. **Journal of the Taiwan Institute of Chemical Engineers**, 106, 169-182.

3. **Tu, J.**, and Sheng, J. (**2020**) Effect of pressure on imbibition in shale oil reservoir with different wettability considered. Energy & Fuels, 34(4), 4260-4272

4. **Tu, J.**, and Sheng, J. (**2020**) Further Investigation of Forced Imbibition on Enhanced Oil Recovery in Unconventional Oil Reservoirs. **Energy & Fuels**, 34(4), 10676–10687

5. Adu-Gyamfi, B., Ampomah, W., Sun, Q., Will, R., & **Tu, J.** (**2021**). Evaluation of Geo-Mechanical-Chemical Impacts of Co2 Injection to Depleted Oil Reservoirs. 15th **Greenhouse Gas Control Technologies Conference** 15-18 March 2021.

6. Acheampong, S., Ampomah, W., **Tu, J.**, Balch, R., Eales, M., Trentham, R., Esser, R., Cady, C., Cather, M. and George, E.K., (**2022**), April. Development of Site Characterization and Numerical Modeling Workflow of Acid Gas Injection for MRV-45Q Application. In **SPE Improved Oil Recovery Conference**. OnePetro.

7. You, J., Ampomah, W., **Tu, J.**, Morgan, A., Sun, Q., Wei, B. and Wang, D., (**2022**). Optimization of Water-Alternating-CO2 Injection Field Operations Using a Machine-Learning-Assisted Workflow. **SPE Reservoir Evaluation & Engineering**, 25(02), pp.214-231.

8. Adu-Gyamfi, B., Ampomah, W., **Tu, J.**, Sun, Q., Erzuah, S. and Acheampong, S., (**2022**). Assessment of chemo-mechanical impacts of CO2 sequestration on the caprock formation in Farnsworth oil field, Texas. **Scientific Reports**, 12(1), p.13023.

9. **Tu, J.**, Ampomah, W., Moodie, N., Ulmer-Scholle, D., Martin, L., Wells, E. and Parwar, R., (**2022**), September. Demonstration Numerical Simulation of Field-Scale CO2 Sequestration Project with Complex Faulting System in San Juan Basin, USA. In **SPE Annual Technical Conference and Exhibition**. OnePetro.

10. Pawar, R., Chu, S., Carey, J.W., **Tu, J.**, Moodie, N., Chen, B. and Ampomah, W., (**2022**). Quantitative Risk Assessment of Leakage through Legacy Wells in Support of Permit Application for a Large-scale CO2 Injection Project in Southwestern US. **Greenhouse Gas Control Technologies (GHGT) Conference** 2022.

11. Adu-Gyamfi, B., Ampomah, W., **Tu, J.**, Sun, Q., Erzuah, S. and Sarkodie-Kyeremeh, J., (**2022**). Simulation study of chemo-mechanical impacts of CO2 injection in Morrow B sandstone reservoir. **Greenhouse Gases: Science and Technology**, 12(6), pp.764-783.

12. Xiao, T., **Tu, J.**, Wang, B., Esser, R., Bailey, T., Cather, M., Tian, H. and McPherson, B., (**2023**). Chemical impacts of subsurface CO2 and brine on shallow groundwater quality. **Chemosphere**, p.138048.

PROFESSIONAL SERVICES

Research Experience in Carbon Sequestration (RECS)
Alumni of RECS 2022: a two-week immersive training of a selective network for young professionals on topics associated with CCUS science, technology, policy, and business. **https://recs-ccus.org/**
Faculty of RECS 2023:
Presentation: Transforming Associated Gas Treating Facility of Oil and Gas Industry by Qualifying 45Q Tax Credit with Class II Well Injection through Subpart R.R. Reporting

Society of Petroleum Engineers (SPE) International
Committee Member and Reviewer
SPE Annual Technical Conference and Exhibition (2023-2026)
Session Committee Chairpersons
Decarbonization Projects and Operations: CCUS and Renewable Energy

Journal and Funding Review Services
- Greenhouse Gases: Science and Technology (GHGT)
- Journal of Petroleum Science and Engineering (JPSE)
- Geoenergy Science and Engineering
- SPE Journal
- SPE Production & Operations
- SPE Reservoir Engineering & Formation Evaluation
- Journal of Porous Media
- Geofluids
- Energies
- Lithosphere
- Scientific Reports
- ACS Petroleum Research Fund