

Olufemi Olorode

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[Google Scholar Profile](#) | [Research Website](#)

RESEARCH INTERESTS

- Multiscale modeling of coupled physical processes in fractured tight rocks.
- Large-scale molecular simulations of gas hydrate formation and dissociation.
- Numerical simulation of CO₂ storage and hydrogen production.
- Compositional reservoir modeling and physics-constrained deep learning.
- Numerical and experimental studies of geomechanics and fracture propagation.

EDUCATION

- PhD Petroleum engineering, Texas A&M University (GPA:4/4) **August 2017**
- MS Petroleum engineering, Texas A&M University (GPA:3.9/4) **August 2011**
- BS Petroleum engineering, University of Ibadan **June 2008**

COURSES TAUGHT

- PETE 7241 Multiscale Simulation of Unconventional Resources **2018, 2022**
- PETE 4241 Mechanical Earth Modeling **2019, 2020**
- PETE 2061 [Python, Statistics and Data Visualization for Petroleum Engineers](#) **2019-2023**
- PETE 4056 Numerical Simulation of Improved Recovery Processes **2021-2023**
- PETE 7999 Graduate Seminar **2019, 2020**

AWARDS & RECOGNITION

- 2018 SPE Journal Outstanding Technical Editor Award

STUDENT RESEARCH SUPERVISION

- **Ph.D. Degree Advisor**
 1. Harun Rashid, May 2023 (expected)
 2. Meisam Adibifard, May 2023 (expected)
- **M.Sc. Degree Advisor**
 1. Hassan Amer, August 2021
 2. Thelma Ihunde, May 2022
 3. Ahmed Abdullah, December 2024 (expected)
 4. Chibuzor Igweonu, May 2025 (expected)

GRADUATE THESIS AND DISSERTATION COMMITTEES SERVED

- **Ph.D. Degree Committee Member**

1. Dayo Afekare, May 2021
2. Bin Wang, December 2021
3. Temitope Ajayi, May 2022
4. Refaat Hashish, December 2022

- **Ph.D. Degree Deans Representative**

1. Zhuo Wei, December 2020
2. Rasheed Ajala, December 2022
3. Samarawickrama Nuwanthi, May 2024 (Expected)

- **M.Sc. Non-Thesis Committee Member**

1. MaKuachukwu Mbaegbu

EXTERNAL RESEARCH FUNDING (Total Amount: \$1.6 M; Fraction to Me: \$0.7 M)

- DOE BES, Coarse-Grained Molecular Studies of CO₂ Storage in Gas Hydrates, 2023-2026, PI (Total: \$525,000; PI Fraction: \$525,000)
- ACS ND, Effects of fluid pressurization rate and injection section length on hydraulic fracturing breakdown pressure: experimental study and theoretical analysis, 2023-2025, Co-PI (Total: \$110,000; Co-PI Fraction: \$44,000)
- LSU LIFT², Carbon dioxide removal through biomass slurry fracture injection, 2022-2023, Co-PI (Total: \$44,910; Co-PI Fraction: \$14,820)
- BIRD, Safe, sustainable, and resilient development of offshore reservoirs and natural gas upgrading through innovative technology and science, 2020-2025, Co-PI (Total: \$916,900; Co-PI Fraction: \$91,690)

PROFESSIONAL ACTIVITIES

- Technical Editor, Society of Petroleum Engineers (SPE) Journal **2015 - Date**
- Technical Editor, Journal of Petroleum Science & Engineering (JPSE) **2016 – Date**
- Technical Editor, ACS Energy & Fuels **2019 – Date**
- Technical Editor, IEEE Transactions on Geoscience and Remote Sensing (TGRS) **2020 – Date**
- Technical Editor, Energies **2019 – Date**
- Technical Editor, Rock Mechanics and Rock Engineering (RMRE) **2019 – Date**
- Steering Committee Member, Southern US InterPore Chapter **2021 – Date**
- Steering Committee Member, West African InterPore Chapter **2022 – Date**
- Communications Officer, West African InterPore Chapter **2022 – Date**
- Technical Reviewer, NSF and ACS Proposals **2020 – Date**
- Session chair, Southeast Symposium on Contemporary Engineering Topics (SSCET) & UNO Engineering Forum, **2022 and 2019**

EXPERIENCE

- | | | |
|---------------------------|--|-------------|
| • Assistant Professor | Louisiana State University (Baton Rouge, LA) | 2018 - Date |
| • Postdoctoral Researcher | Texas A&M University (College Station, TX) | 2017 - 2018 |
| • Graduate Assistant | Texas A&M University (College Station, TX) | 2015 - 2017 |
| • Petroleum Engineer | Afren Resources (Houston, TX) | 2011 – 2015 |

POST-DOCTORAL RESEARCH, TEACHING & RESEARCH EXPERIENCE (Texas A&M University)

- Taught lab sessions and certain topics in an undergraduate petrophysics course.
- Experience with modeling and experimental work on shale petrophysics and natural gas hydrates.
- Integration of molecular simulation results, multi-scale reservoir simulation and experimental data.
- Developed a new coupled geomechanics and compositional shale-gas reservoir simulator.
- Developed C++ code for unstructured gridding of complex fracture geometries
- Developed code for flash computations in nanopores.
- Developed codes for reservoir model calibration using differential evolution.
- Applied machine learning to petrophysical analysis of well log data.
- Used K-means clustering to identify minerals in shale SEM images for numerical homogenization.

PROFESSIONAL EXPERIENCE

AFREN RESOURCES, The Woodlands, TX

Reservoir Engineer, July 2011 – June 2015

- Reservoir simulation and model calibration using genetic algorithms and evolutionary strategies.
- Uncertainty analyses and well location optimization using experimental design and response surface modeling.
- Pressure Transient Analyses, Decline Curve Analyses, and Material Balance Analyses.
- Probabilistic reserves estimation using Monte Carlo Simulation.
- Developed a computer program for integrated production forecasting for all the company's assets.
- Developed an improved semi-analytical FORTRAN code for SAGD.

JOURNAL PUBLICATIONS (* indicates Dr. Olorode's students, + indicates visiting PhD student, and ** indicates Dr. Olorode as the corresponding author)

- H. Rashid* and **O. M. Olorode****, 2023. "A Continuous Projection-based EDFM Model for Flow in Fractured Reservoirs". SPE Journal (<https://doi.org/10.2118/217469-PA>).
- M. Adibifard* and **O. M. Olorode****, 2023. "Large-Scale Nonequilibrium Molecular Studies of Thermal Hydrate Dissociation". Journal of Physical Chemistry B, Volume 127, Issue 29, 6543–6550 (<https://doi.org/10.1021/acs.jpcc.3c03391>).
- U. Egbe, O. Awoleke, **O. M. Olorode****, Scott Goddard, 2023. "On the Application of Probabilistic Decline Curve Analysis to Unconventional Reservoirs". SPE Reservoir Evaluation & Engineering 26 (02), 244-260 (<https://doi.org/10.2118/212837-PA>).

- **O. M. Olorode**** and H. Rashid*, 2022. “Analytical Modification of EDFM for Transient Flow in Tight Rocks”. Scientific Reports 12 (1), 22018 (<https://doi.org/10.1038/s41598-022-26536-w>).
- H. Rashid* and **O. M. Olorode****, 2022. “An iteratively coupled model for flow, deformation, and fracture propagation in fractured unconventional reservoirs.” Journal of Petroleum Science and Engineering, Volume 214, July 2022, 110468 (<https://doi.org/10.1016/j.petrol.2022.110468>).
- H. Amer* and **O. M. Olorode****, 2022. “Numerical Evaluation of a Novel Slot-Drill EOR Technology for Tight Rocks”. SPE Journal, Volume 27, Issue 04 2294-2317 (<https://doi.org/10.2118/209597-PA>).
- T. Ihunde* and **O. M. Olorode****, 2022. “Application of physics informed neural networks to compositional modeling.” Journal of Petroleum Science and Engineering, Volume 211, April 2022, 110175 (<https://doi.org/10.1016/j.petrol.2022.110175>).
- B. Yang, H. Wang, Z. Shen, **O. M. Olorode**, B. Wang, Y. Zheng, W. Yan, and Z. Jia, 2021. “Full-Sample X-ray Microcomputed Tomography Analysis of Supercritical CO₂ Fracturing in Tight Sandstone: Effect of Stress on Fracture Dynamics”. Energy Fuels Journal, 2021, Volume 35, Issue 02, 1308–1321 (<https://doi.org/10.1021/acs.energyfuels.0c03554>).
- **O. M. Olorode****, B. Wang, H. U. Rashid*, 2020. “Three-Dimensional Projection-Based Embedded Discrete Fracture Model for Compositional Simulation of Fractured Reservoirs”. SPE Journal, 2020, Volume 25, Issue 04, 2143–2161 (<https://doi.org/10.2118/201243-PA>).
- **O. M. Olorode****, Y. I. Akkutlu, Y. Efendiev, 2017. “Compositional Reservoir Flow Simulation for Organic-rich Gas Shale”. SPE Journal, 2017, Volume 22, Issue 06, 1963–1983 (<https://doi.org/10.2118/182667-PA>).
- T. A. Blasingame, **O. M. Olorode**, T. O. Odunowo, G.J. Moridis, C.M. Freeman, 2014. “Evaluation of Well Performance for the Slot-Drill Completion in Low and Ultra-Low Permeability Oil and Gas Reservoirs”. SPE Journal, 2014, Volume 19, Issue 05, 748–760 (<https://doi.org/10.2118/164547-PA>).
- **O. M. Olorode****, C. M. Freeman, G. J. Moridis, T. A. Blasingame, 2013. “High-Resolution Numerical Modeling of Complex and Irregular Fracture Patterns in Shale Gas and Tight Gas Reservoirs”. SPE Reservoir Evaluation & Engineering, 2013, Volume 16, Issue 04, 443–455 (<https://doi.org/10.2118/152482-PA>).

PEER-REVIEWED ARTICLES & BOOK CHAPTER

- **O. M. Olorode****, Wang, B., Rashid, H*. (2021). Numerical Modeling of Fractured Unconventional Oil and Gas Reservoirs. Chapter 10 of the *Advanced Modeling with the MATLAB Reservoir Simulation Toolbox (MRST)*, 409-453, Cambridge University Press (<https://doi.org/10.1017/9781009019781>).
- **O. M. Olorode**, Y. I. Akkutlu, Y. Efendiev. “Modeling of Compositional Gas Transport in Shale as a Deformable Porous Medium”. Peer-reviewed article in the 6th Biot Conference Proceedings, July 2017 (<https://doi.org/10.1061/9780784480779.246>).

CONFERENCE MANUSCRIPTS

- A. Abdullah*, H. Rashid*, and **O. M. Olorode****. “Numerical and Experimental Studies of Coupled THM Processes in Fractured Tight Rocks”, presented at the 57th U.S. Rock Mechanics/Geomechanics Symposium, Atlanta, Georgia, USA, June, 2023 (<https://doi.org/10.56952/ARMA-2023-0810>).
- **O. M. Olorode****, H. Amer*, and H. Rashid*. "The role of diffusion in primary and enhanced oil recovery from fractured unconventional reservoirs". URTEC-208387-MS, presented at the Asia Pacific Unconventional Resources Technology Conference in November, 2021 (<https://doi.org/10.15530/AP-URTEC-2021-208387>).
- H. Rashid*, **O. M. Olorode****, and C. Chukwudozie. "An iteratively coupled model for flow, deformation, and fracture propagation in fractured unconventional reservoirs". URTEC-208314-MS, presented at the Asia Pacific Unconventional Resources Technology Conference in November, 2021 (<https://doi.org/10.15530/AP-URTEC-2021-208314>).
- T. Ihunde* and **O. M. Olorode****. “Application of physics informed neural networks to compositional modeling." URTEC-208310-MS, presented at the Asia Pacific Unconventional Resources Technology Conference in November, 2021 (<https://doi.org/10.15530/AP-URTEC-2021-208310>).
- B. Y. Kim, **O. M. Olorode**, Y. I. Akkutlu. “Multi-Scale Analysis of CO Injection as Improved Shale Gas Recovery Method". SPE 195528-MS, presented at the SPE Europec featured at the 81st EAGE Conference and Exhibition, 3-6 June, 2019, London, England, UK (<https://doi.org/10.2118/195528-MS>).
- **O. M. Olorode****, Y. I. Akkutlu, Y. Efendiev. “Modeling of Compositional Gas Transport in Shale as a Deformable Porous Medium”. Peer-reviewed article in the 6th Biot Conference Proceedings, July 2017 (<https://doi.org/10.1061/9780784480779.246>).
- I. Y. Akkutlu, S. Baek, **O. M. Olorode**. “Shale Resource Assessment in the Presence of Nanopore Confinement”. SPE-2670808-MS, presented at the URTEC Conference in July 2017 (<https://doi.org/10.15530/URTEC-2017-2670808>).
- **O. M. Olorode****, Y. I. Akkutlu, Y. Efendiev. “A Compositional Model for CO₂ Storage in Deformable Organic-Rich Shales”. SPE-185792-MS, presented at the EUROPEC Conference in June 2017 (<https://doi.org/10.2118/185792-MS>).
- **O. M. Olorode****, Y. I. Akkutlu, Y. Efendiev. “Compositional Reservoir Flow Simulation for Organic-rich Gas Shale”. SPE 182667-MS, presented at the SPE Reservoir Simulation conference in February 2017 (<https://doi.org/10.2118/182667-MS>).
- T. A. Blasingame, **O. M. Olorode**, T. O. Odunowo, G.J. Moridis, C.M. Freeman. “Evaluation of Well Performance for the Slot-Drill Completion in Low and Ultra-Low Permeability Oil and Gas Reservoirs". SPE 164547-MS, presented at the SPE Unconventional Resources Conference in April 2013 (<https://doi.org/10.2118/164547-MS>).
- **O. M. Olorode****, C. M. Freeman, G. J. Moridis, T. A. Blasingame. “High-Resolution Numerical Modeling of Complex and Irregular Fracture Patterns in Shale Gas and Tight Gas

Reservoirs”. SPE 152482-MS, presented at the SPE Latin America and Caribbean Petroleum Engineering Conference in January 2012 (<https://doi.org/10.2118/152482-MS>).

INVITED TALKS/PRESENTATIONS

- Civil Engineering Departmental Seminar at New Jersey Institute of Technology, November 2023
 - Title: Numerical Modeling of Unconventional Resources.
- Southeast Symposium on Contemporary Engineering Topics (SSCET) & UNO Engineering Forum, Little Rock, AR, September, 2022
 - Title: Modeling of Coupled Physical Processes in Tight Rocks.
- Energy Resources Engineering Departmental Seminar at Stanford University, October 2021
 - Title: Multiscale Modeling of Coupled Physical Processes in Tight Rocks.
Please [Watch video here](#)
- Petroleum Engineering Departmental Seminar at University of Wyoming, September 2021
 - Title: Numerical Modeling of Unconventional Oil and Gas Reservoirs.
- Plenary Talk at the MRST Simulation Symposium, September 2021
 - Title: Numerical Modelling of Fractured Unconventional Oil and Gas Reservoirs.
Please [Watch video here](#)
- Southeast Symposium on Contemporary Engineering Topics (SSCET) & UNO Engineering Forum, New Orleans, LA, September, 2019
 - Title: Numerical Modeling of Multiscale Fractures in Unconventional Oil and Gas Reservoirs.