

Olufemi Olorode

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

RESEARCH INTERESTS

- Large-scale molecular simulations of hydrate-based energy storage.
- Physics-informed deep learning.
- Mixed reality (MR) visualization
- Numerical and experimental studies of CO₂ storage and hydrogen production.
- Multiscale modeling of coupled physical processes in fractured porous media.

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**

EXTERNAL RESEARCH FUNDING (Total Amount: \$4.1 M; Fraction to PI: \$1.9 M)

#	Project Title	Sponsor	Project Duration	PI	Co-PIs	Total Grant Amount	Fraction to Dr. Olorode
1	TUL-SCC-558627-20/21/Safe, sustainable and resilient development of offshore reservoirs and natural gas upgrading through innovative technology and science	BIRD	09/2020 –08/2025	Thompson , K. E.	Olorode, O. M., Sharma, J., Gupta, I., Almeida, M. A., Ding, K., Spivey, J. J., Dooley, K. M.	\$916,900	\$91,690
2	Carbon dioxide removal through biomass slurry fracture injection	LSU LIFT ²	03/2022-02/2024	Snyder, B.	Olorode O. M., Johnson C.	\$44,910	\$14,820

3	Coarse-Grained Molecular Studies of CO ₂ Storage in Gas Hydrates	DOE	09/2023-08/2026	Olorode, O. M	-	\$525,000	\$525,000
4	Effects of fluid pressurization rate and injection section length on hydraulic fracturing breakdown pressure: experimental study and theoretical analysis	ACS	09/2023-08/2026	Chen, S.	Olorode, O. M.	\$110,000	\$44,000
5	ULTRA-H ₂ : Reservoir Management of Natural Hydrogen from Ultramafic Rocks	DOE ARPA-E	09/2024-08/2026	Olorode, O. M.	Waltrich, P.	\$553,820	\$276,910
6	Monkey Island Carbon Storage Project	DOE	08/2024 – 07/2026	Zeidouni, M.	Gupta, I., Olorode, O. M.	1,473,884	486,382
7	CAREER: Molecular Studies of Enhanced Hydrogen Hydrate Storage	NSF	06/2025-05/2030	Olorode, O. M	-	\$500,000	\$500,000
					Total	\$4,124,514	\$1,938,802

COURSES TAUGHT

- PETE 7241 Multiscale Simulation of Unconventional Resources **2018, 2022, 2024**
- PETE 4241 Mechanical Earth Modeling **2019, 2020**
- PETE 2061 [Python, Statistics and Data Visualization for Petroleum Engineers](#) **2019-2024**
- PETE 4056 Numerical Simulation of Improved Recovery Processes **2021-2025**
- PETE 7999 Graduate Seminar **2019, 2020**

AWARDS & RECOGNITION

- NSF CAREER Award, 2025
- 2018 SPE Journal Outstanding Technical Editor Award

- AWS Certified Developer Associate
- LSU CxC Certificate of Excellence

STUDENT RESEARCH SUPERVISION

- **Ph.D. Degree Advisor**
 1. Harun Rashid, May 2024
 2. Meisam Adibifard, December 2024
 3. Temitayo Adeyemi, May 2027 (expected)
 4. Sid Ahmed Hammoudi, May 2028 (expected)
- **M.Sc. Degree Advisor**
 1. Hassan Amer, August 2021
 2. Thelma Ihunde, May 2022
 3. Ahmed Abdullah, May 2025
 4. Chibuzor Igweonu, December 2025 (expected)
 5. Victory Oghale, December 2026 (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
 5. Chico Sambo, December 2024
 6. Fatima Yisa, December 2024
 7. Richard Budiman, May 2025
- **Ph.D. Degree Deans Representative**
 1. Zhuo Wei, December 2020
 2. Rasheed Ajala, December 2022
 3. Samarawickrama Nuwanthi, December 2025 (Expected)
 4. Fazle Elahi, December 2027 (Expected)
- **M.Sc. Non-Thesis Committee Member**
 1. Ibrahim Almati, May 2019
 2. MaKuachukwu Mbaegbu, December 2020
 3. Edem Mensah, May 2025

PROFESSIONAL ACTIVITIES

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|--|--------------------|
| • Technical Reviewer, NSF, DOE, and ACS Proposals | 2020 – Date |
| • 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**
- Technical Editor, Advances in Geonergy Research (AGER) **2024 – Date**
- Technical Editor, Scientific Reports **2024 – 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**
- Session chair, Southeast Symposium on Contemporary Engineering Topics (SSCET) & UNO Engineering Forum, **2022 and 2019**

EXPERIENCE

- Associate Professor Louisiana State University (Baton Rouge, LA) **August 2025 - Date**
- Assistant Professor Louisiana State University (Baton Rouge, LA) **2018 – August 2025**
- 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)

20. Kolawole, O., Ngoma, M., and **Olorode, O. M.**, 2025. "Experimental and Computational Insights into the Nanomechanical Characterization of Ultramafic Rocks for Geologic Hydrogen Production and Storage". In press, Rock Mechanics and Rock Engineering Journal.
19. Adeyemi, T* and **Olorode, O. M.****, 2025. "Molecular Studies and Advanced Visualization of the Trapping of Methane Nanobubbles During Hydrate Growth". Journal of Physical Chemistry B (<https://doi.org/10.1021/acs.jpcc.4c07851>).
18. Adibifard, M.* and **Olorode, O. M.****, 2025. "Coarse-Grained Molecular Studies Reveal Potential for Increased CO₂ Storage in Hydrates". Materials Today Sustainability Journal (<https://doi.org/10.1016/j.mtsust.2025.101106>).
17. **Olorode, O. M.****, Kolawole, O., Igweonu, C. S.*, Rashid, H. U.*, 2025. "Taking bio-induced precipitation to the field for sustainable geo-energy storage: Experimental and numerical studies of leakage mitigation". Journal of Energy Storage, Volume 112 (<https://doi.org/10.1016/j.est.2025.115474>).
16. Onwumelu, C., Kolawole, O., Nordeng, S., and **Olorode, O. M.****, 2024. "Assessing the Effect of Thermal Maturation on Shale Organic Matter via PeakForce Quantitative Nanomechanical Mapping". Rock Mechanics Bulletin (<https://doi.org/10.1016/j.rockmb.2024.100128>).
15. Zhou, B., Chen, Z., Song, Z., Tang, Z., Wang, B., and **Olorode, O. M.****, 2024. "A New Numerical Well-Test Model for Naturally Fractured Reservoirs Using an Analytically Modified Embedded Discrete Fracture Model". Journal of Hydrology (<https://doi.org/10.1016/j.jhydrol.2024.131330>).
14. Ngoma, M., Kolawole, O., and **Olorode, O. M.**, 2024. "Geothermo-Mechanical Alterations Due to Heat Energy Extraction in Enhanced Geothermal Systems: Overview and Prospective Directions". Deep Underground Science and Engineering Journal (<https://doi.org/10.1002/dug.2.12109>).
13. Rashid, H* and **Olorode, O. M.****, 2024. "Use of controlled fractures in enhanced geothermal systems". Advances in Geo-Energy Research Journal, Volume 12, Issue 1 (<https://doi.org/10.46690/ager.2024.04.04>).
12. Rashid, H* and **Olorode, O. M.****, 2024. "A Continuous Projection-based EDFM Model for Flow in Fractured Reservoirs". SPE Journal, Volume 29, Issue 1 (<https://doi.org/10.2118/217469-PA>).
11. Adibifard, M.* and **Olorode, O. M.****, 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>).
10. Egbe, U., Awoleke, O., **Olorode, O. M.****, Goddard, S. 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>).
9. Olorode, O. M.** and Rashid, H.*, 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>).
8. Rashid, H.* and **Olorode, O. M.****, 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>).
7. Amer, H.* and **Olorode, O. M.****, 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>).
6. Ihunde, T.* and **Olorode, O. M.****, 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>).
5. Yang, B., Wang, H., Shen, Z., **Olorode, O. M.****, Wang, B., Zheng, Y., Yan, W., and Jia, Z., 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>).
 4. **Olorode, O. M.****, Wang, B., Rashid, H. U.*, 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>).
 3. **Olorode, O. M.****, Akkutlu, Y. I., Efendiev, Y., 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>).
 2. Odunowo, T. O., Moridis, G. J., Blasingame, T. A., **Olorode, O. M.**, Freeman, C. M., 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>).
 1. **Olorode, O. M.****, Freeman, C. M., Moridis, G. J., Blasingame, T. A. 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

- Oppong, F., Kolawole, O., and O. M. Olorode. "Rock Mechanical Characterization of Epoxy-Based Grouted Sandstone." Paper presented at the 58th U.S. Rock Mechanics/Geomechanics Symposium, Golden, Colorado, USA, June 2024. doi: <https://doi.org/10.56952/ARMA-2024-0155>
- Ngoma, M. C., Kolawole, O., Olorode, O., and T.-H. Kwon. "Experimental Study of the Effect of Porosity on EICP Biomineralization in Dolostone and Shales Under Uniaxial Compressive Stress Condition." Paper presented at the 58th U.S. Rock Mechanics/Geomechanics Symposium, Golden, Colorado, USA, June 2024. doi: <https://doi.org/10.56952/ARMA-2024-0146>
- B. Zhou, Z. Chen, Z. Song, X. Zhao, B. Wang, and **O. M. Olorode**. "A New Numerical Well-test Model Using An Analytically Modified Embedded Discrete Fracture Model", presented at the International Petroleum Conference, Saudi Arabia, February, 2024.
- 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 Energy 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.