

ARASH DAHI TALEGHANI

CONTACT INFORMATION

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EDUCATION

- Ph.D. in Petroleum Engineering, *The University of Texas at Austin*, Austin, TX, USA, 2009
- M.S. in Structural Mechanics and Material, *Sharif University of Technology*, Tehran, Iran, 2003
- B.S. in Civil Engineering, *Sharif University of Technology*, Tehran, Iran, 2001

LICENSE AND CERTIFICATE

- Registered Professional Petroleum Engineer in the state of Texas (PE) since 2013
- Certified GARP Energy Risk Professional (ERP), 2016

PROFESSIONAL EXPERIENCE

- Professor of Petroleum Engineering, Department of Energy and Mineral Engineering, *Pennsylvania State University*, 2022– Present
- Associate Professor of Petroleum Engineering, Department of Energy and Mineral Engineering, *Pennsylvania State University*, 2017–2022
- Associate Professor, Department of Petroleum Engineering, *Louisiana State University*, 2015–2017
- Assistant Professor, Department of Petroleum Engineering, *Louisiana State University*, 2009–2015
- Summer Intern, *Schlumberger Data and Consulting Services*, 2007
- Summer Intern, *Schlumberger Data and Consulting Services*, 2006
- Research/Teaching Assistant, Petroleum Engineering, *The University of Texas at Austin*, 2004-2009
- Research/Teaching Assistant, Dept. of Civil Engineering, *Sharif University of Technology*, 2003-2004
- Engineer, *Ghana-Beton Construction Company* 2001-2003

AWARDS, HONORS, AND APPOINTMENTS

- The Quentin E. and Louise L. Wood University Endowed Fellowship 2022-2027.
- SPE ATCE Program Committee for Energy Transition, 2023-2026.
- Committee Member of SPE R&D Technical Section, 2022-2024.
- SPE Distinguished Lecturer on topic of repurposing oil and gas wells into geothermal wells, 2022-23.
- Chair of SPE Education and Accreditation Committee, 2022-2023.
- Member of SPE Education and Accreditation Committee, 2021-2022.
- Dr. Charles H. Bowman and Lynn A. Holleran Early Career Professorship, 2019-2022.
- Member of Completions Technical Committee for SPE ATCE 2020-2022.
- Editorial Board Member of the Journal of Multiscale Science and Engineering published by Springer
- SPE Eastern North America Regional Completion Optimization and Technology Award, 2017
- NCEES PE Petroleum Exam Committee member since 2017
- Recognized as a "Future Leader" by American Rock Mechanics Association
- Wellbore Stimulation and Production Enhancement Committee SPE ATCE 2017-2019.
- Co-director of Unconventional Oil and Gas Summer School, Dubrovnik, Summer 2016
- SPE Scholarship and Fellowship Committee (2015-2016)
- LSU Foundation Tigers Undergraduate Teaching Award, 2015
- Co-director of Petroleum Engineering Summer School, Dubrovnik, Summer 2015
- SPE Distinguished Achievement Award for Petroleum Engineering Faculty, 2014
- Associate Editor for ASME Journal of Energy Resources and Technology, since 2013
- Associate Editor for Journal of Frontiers in Mechanical Engineering, since 2020.
- SPE Petroleum Engineering Junior Faculty Research Initiation Award, 2012

RESEARCH INTEREST

- Injectivity changes and sand production in injector wells
- Drill bit and rock interactions
- Mechanics and oilfield application of shape memory polymers
- Development of loss circulation materials
- Wellbore integrity
- Generalized finite element methods
- Petroleum geomechanics

- Hydraulic refracturing materials (diverters)
- Petroleum geomechanics
- Enhanced geothermal systems
- Hydraulic fracturing simulation and design
- Atomistic modeling of fracture propagation in heterogeneous media

PATENTS

- Coal-Based Surface Modified Additives For High Thermal Conductivity Grout, US104283.0009PRO
- Geothermal Cementing System with Aluminum Fibers and Carbon Fillers US104283.0011PRO
- Geothermal Cementing System with High Thermal Conductivity, United States Appl. No. 63/323,682
- Shape memory polymer proppants, methods of making shape memory polymer proppants for application in hydraulic fracturing treatments, US Patent US10538694B2
- Methods of treating oil and gas well fractures, US Patent US20180037803A1.
- Methods for temporary fracture isolation, US Patent US20190024490A1.
- Cement materials including shape memory polymer and methods of making cement materials, WO2017184813A1, US10876030B2
- Using graphite nano-platelets to improve the integrity of oil and gas wells, US Patent US20200308469A1
- Proppant Function Enhancement - US Provisional Pat. App. No. 63/141,196
- Shape memory polymer proppants and methods of making shape memory polymer proppants for application in hydraulic fracturing treatments, CA2911139A1.

TEACHING

- Undergraduate level: Production Engineering, Numerical Methods; Well Logging, Mechanical Earth Modelling, Unconventional Reservoirs.
- Graduate level: Advanced Wellbore Stimulation; Petroleum Rock Mechanics; Advanced Production and Completion Systems.
- Industry Short Courses: Overview of the Hydraulic Fracturing Design, Rock Mechanics for Drillers, Sand production; Prediction and Mitigation.

CONSULTING SERVICE TO THE INDUSTRY

- JOGMEG, Japan, 2018.
- Sonatrach, Algeria. 2018.
- INA, Croatia, 2016-2018.
- Shell, Houston, TX. 2015-2016, 2018.

- Battelle, West Palm Beach, FL 2014
- Merlyn Energy, 2013
- PEMEX 2010-2013
- Domain expert in several cases of IP litigation 2017-2019
- Expert witness in multiple cases of legal litigation since 2013

INVITED TALKS

- Panelist in a Special Session of Discussing the repurposing of Oil and Gas wells to provide geothermal energy in SPE ATCE 2023.
- Protecting Wellbore Components for Safe and Effective Underground Storage of Hydrogen, North American Hydrogen Demand and Infrastructure Development, Houston, TX, December 2022.
- Overview of Potential Lithium Resources in Produced Fluids in the Marcellus Shale, Shale Water Management Marcellus and Utica Congress in Pittsburgh, PA, October, 2022.
- On modelling Hydraulic Fracturing in Naturally Fractured Reservoirs, Peking University, March 2022.
- Surface Modified Graphite Nanoplatelets to Enhance Cement Sheath Integrity, Graduate Seminar University of Southern California, March 2022.
- Smart Expandable Loss Circulation Material to Seal Large Fractures, The University of Texas at Austin, Austin TX, February, 2022.
- Smart Expandable Fiber Additive to Improved Zonal Isolation in Geothermal Wells, GR-SPE High-Temperature Well Cementing, San Diego, Ca, October 2021.
- Flowback Analysis; A New Window for Post Fracturing Analysis presented at PSSP-21 Workshop at the National University "Yuri Kondratyuk Poltava Polytechnic" in Poltava, Ukraine, on September 29th, 2021.
- On Repurposing Oil and Gas Wells to Geothermal Wells, University of Zagreb, Croatia, June 2021.
- Surface Modified Graphite Nanoplatelets to Enhance Cement Sheath Integrity, Graduate Seminar University of Wyoming, March 2021.
- New Cement Systems for Well Cementing, Pennsylvania Department of Environmental Protection, March 2021.
- Revisiting Casing Failure Problems by Simulating Well Construction Processes, SPE Summit on Casing Deformation, February 2021.
- Nano-Engineered Cement Solutions for Permanent Plugging of oil and Gas Wells, Pennsylvania Department of Environmental Protection, February, 2021.
- Simulating Sealing Mechanisms by Granular LCM at Elevated Temperatures, Lawrence Berkeley National Lab, May 2020.
- Cement Sheath Mechanical Integrity from Different Angles at National Energy Technology Laboratory, February, 2020.

- On Injectivity Changes During Waterflooding in Unconsolidated Formations, China Southwest Petroleum University, Chengdu, China, January, 2020.
- Cement Nano-Reinforcement to Improve Sealing Performance, Morgan Applied Materials, State College, PA, USA, Dec. 2019
- Graphite Cement Nanocomposites for Applications in Oil and Gas Wells, DOE NETL, Pittsburgh, PA, Oct. 2019.
- Modeling Production Flowback after Hydraulic Fracturing, Chevron Co., Houston, TX, Sept. 2019.
- Is Complexity of Hydraulic Fractures tunable? A Question from Design Perspective, Xinghua University, China, June, 2019.
- Is Complexity of Hydraulic Fractures tunable? A Question from Design Perspective, China University of Petroleum, Beijing, China, June, 2019.
- Is Complexity of Hydraulic Fractures tunable? A Question from Design Perspective, China University of Geosciences, Beijing, China, June, 2019.
- On Injectivity Changes During Waterflooding in Unconsolidated Formations, Texas A&M University, College State, TX, February, 2019.
- Hydraulic Fracturing Design and Analysis, JOGMEG, Japan, Dec. 2018.
- Workshop of Development of Unconventional Resources, Sonatrach, Algeria, May 2018.
- SMP Sealing Additives for Cementing Oil and Gas Wells, Halliburton Cement Leaders Forum, Houston, TX, October 5th, 2016.
- Smart Expandable Loss Circulation Materials, American Association of Drilling Engineering Technical Forum, New Orleans, September 9th, 2016.
- Hydraulic Fracturing Design, Petroleum Engineering Summer School (PESS), Workshop 37, June 15nd to June 19th 2015 in Dubrovnik by University of Zagreb.
- Failure Problems in Petroleum Geomechanics, Civil Engineering Department at Sharif University of Technology, April 12th, 2015.
- Hydraulic Fracturing With Special Focus on Treatments in Naturally Fractured Reservoirs, Petroleum Engineering Summer School (PESS), Workshop 37, June 2nd to June 6th 2014 in Dubrovnik by University of Zagreb.
- Geomechanics as a Tool for Better Understanding of Drilling Challenges, AADE New Orleans Chapter Technical Symposium, June 5th, 2014, New Orleans, LA.
- Failure Problems in Petroleum Geomechanics, University of Texas at Austin, April 2014, Austin, TX.
- Geomechanics: A New Look for Better Understanding of Drilling Challenges, AADE Deepwater and Emerging Technology Study Group Forum, March 20th, 2014, Houston, TX.
- Natural fractures interaction with hydraulic fractures: A Multi-scale problem, University of Southern California, March 13th, 2014, Los Angeles, CA.
- Interactions between natural fractures and growing hydraulic fracture network, presented at SPE Evangeline chapter, February 14th, 2014, Lafayette, Louisiana
- Opening of Cemented Natural Fractures in Hydraulic Fracturing: A length scale problem, Graduate seminar, University of Kansas, November 11th, 2013.

- Hydraulic fractures interaction with Natural fractures, 11-13 September, 2013 at the Terranea Resort in Palos Verdes, California, Hydraulic Fracturing Mechanics Considerations for Unconventional Reservoirs Workshop
- EPA technical workshop on Well Construction/Operation and Subsurface Modeling, April 16-17, 2013, DOE research triangle complex (RTP), NC
- Houston Geomechanics Group, Growth of Multi-Stranded Hydraulic Fractures and Its Implications on Frac Jobs Design and Implementation, April 2012.

PUBLICATIONS

Books

1. Dahi-Taleghani, A., L. Santos, 2022, Wellbore Integrity From Theory to Practice, ISBN 3031190238, Springer.

Peer-Reviewed Papers

2. Q. Zhang, A. Dahi Taleghani, 2023, Fracture Conductivity Management to Improve Heat Extraction in Enhanced Geothermal Systems, Accepted for publication in International Journal of Heat and Mass Transfer.
3. Liu, S., A. Dahi Taleghani, 2023, Analysis of an enhanced closed-loop geothermal system, *Geoenergy Science and Engineering* (2023): 212296.
4. Al Balushi, F., Q. Zhang, A. Dahi Taleghani, 2023, Improving Enhanced Geothermal Systems Performance Using Adaptive Fracture Conductivity, *Applied Thermal Engineering* 233 (2023): 121206..
5. Henriques, C., A. Dahi Taleghani, 2023, An Evaluation of Fiber-Based Lost Circulation Material for Fracture Plugging using Simulations, *Geoenergy Science and Engineering* 229 (2023): 212144.
6. Zhang Q., A. Dahi Taleghani, 2023, Autonomous Fracture Flow Tuning to Enhance Efficiency of Fractured Geothermal Systems, *Energy*, Volume 281, 128163, ISSN 0360-5442.
7. Al Balushi, F., Q. Zhang, A. Dahi Taleghani, 2023, Autonomous Fracture Conductivity using Expandable Proppants in Enhanced Geothermal Systems, *SPE Journal*: 1-15 doi: <https://doi.org/10.2118/215823-PA>.
8. Santos, L., A. Dahi Taleghani, 2023, Impact of Microannulus on the Efficiency of Heat Transfer in the Bottomhole, *Front. Energy Res., Sec. Advanced Clean Fuel Technologies*, Volume 11, <https://doi.org/10.3389/fenrg.2023.1142662>
9. Tabatabaei, M., A. Dahi Taleghani, 2023, Surface-Modified Graphite Nanoplatelets to Limit Deteriorative Impacts of Oil-Based Mud Residuals on Cement Bonding, *SPE Drilling & Completions* 38 (02): 235–242.
10. Liu, S., A. Dahi Taleghani, 2023, Factors affecting the efficiency of closed-loop geothermal wells, *Applied Thermal Engineering*, 222, p.119947.

11. Zhang Q., W. Liu, J. Wei, A. Dahi Taleghani, H. Sun, D. Wang, 2022, Numerical Simulation Study on Temporary Well Shut-in Method in Development of Shale Oil Reservoir, *Energies*, 15(23), p.9161.
12. Cai Y., A. Dahi Taleghani, 2022, Using Pressure Changes in Offset Wells for Interpreting Fracture Driven Interactions (FDI), *Journal of Petroleum Science and Engineering*, 219, p.111111.
13. Al Balushi, F., A. Dahi Taleghani, 2022, Digital Rock Analysis to Estimate Stress-Sensitive Rock Permeabilities, *Computers and Geotechnics*, 151, p.104960.
14. Yu, H, A. Dahi Taleghani, F. Al Balushi, H. Wang, 2022, Machine Learning for Rock Mechanics Problems; An Insight, *Frontiers in Mechanical Engineering*, DOI: 10.3389/fmech.2022.1003170.
15. Wang, D., Dahi Taleghani, A., Yu, B., Wang, M.; He, C., 2022, Numerical Simulation of Fracture Propagation during Refracturing. *Sustainability* 14, 9422. <https://doi.org/10.3390/su14159422>.
16. Wang, D., Dahi Taleghani, A., Yu, B., 2022, Height Effect on Interactions between the Hydraulic Fracture and Natural Fractures, *Geofluids*, vol. 2022, Article ID 4642326, <https://doi.org/10.1155/2022/4642326>
17. Zhang, Q., A. Dahi Taleghani, 2022, On the Role of Proppants and Geomechanics on Flowback Behavior in Complex Fracture Networks, *Journal of Petroleum Science and Engineering*, 216, p.110835.
18. Santos, L., A. Dahi Taleghani, D. Elsworth, 2022, Repurposing Abandoned Wells for Geothermal Energy: Current Status and Future Prospects Renewable Energy, *Renewable Energy*, Volume 194, July 2022, Pages 1288-1302.
19. Kleit, A., A. Dahi Taleghani, 2022, COVID Shut-In Choices Across Unconventional Reservoirs: Evidence From the Bakken and the Marcellus. *Journal of Energy Resources Technology*, 144(7), p. 073009.
20. Li, L., A. Dahi Taleghani, 2022, Modelling of Cohesive Expandable LCMs for Fractures with Large Apertures, *Geothermics*, Volume 104, September 2022, p. 102466.
21. Wang X, Wang R, Guo R, Dahi Taleghani A, Su S, Ding W, Gong Y, Lai F, Wu Z, Su Y and Cao Z, 2022, Fracture Characterization of Lower Cambrian Niutitang Shale in Cen'gong Block, Southern China. *Front. Earth Sci.* 10:880366. doi: 10.3389/feart.2022.880366
22. Cai Y., A. Dahi Taleghani, 2022, Incorporating injection stage into DFIT analysis for permeability estimation, and its significance, *Journal of Petroleum Science and Engineering*, Volume 215, Part A, August 2022, p 110519.
23. Lin, C. A. Dahi Taleghani, Y. Kang; C. Xu, 2022, A coupled CFD-DEM numerical simulation of fracture sealing by lost circulation materials: Effect of lost circulation material, drilling fluid and fracture, *Fuel*, Volume 322, 15 August 2022, 124212.
24. Yu, H, A. Dahi Taleghani, Z. Lian, T. Lin, 2022, Severe Casing Failure In Multistage Hydraulic Fracturing Using Dual-scale Modelling Approach, accepted for publication in *SPE Drilling & Completion*.

25. Tabatabaei, M., A. Dahi Taleghani, G. Li, 2021, Combination of Shape-Memory Capability and Self-assembly to Plug Wide Remote Fractures, *MRS Communications*, volume 11, pages 770–776.
26. Liu, W., Duan, Y., Zhang, Q., Chen, Z., Yan, X., Sun, H. and Taleghani, D., 2022. Analytical study on a one-dimensional model coupling both darcy flow and low-velocity non-darcy flow with threshold pressure gradient in heterogeneous composite reservoirs. *Journal of Porous Media*, 25(7).
27. Lin, C. A. Dahi Taleghani, 2021, A Coupled CFD-DEM Numerical Simulation of Formation and Evolution of Sealing Zones, *Journal of Petroleum Science and Engineering*, Volume 208, Part D, Pp. 109765.
28. Li, L., A. Dahi Taleghani, 2021, Assessment of LCM Particle Size Distribution on Fracture Sealing; A Numerical Study, *SPE Drilling & Completions*, SPE-209201-PA, <https://doi.org/10.2118/209201-PA>.
29. Zhang, Q., W. Liu, A. Dahi Taleghani, 2021, Numerical Study on Non-Newtonian Bingham Fluid Flow in Development of Heavy Oil Reservoirs Using Radiofrequency Heating Method, *Energy*, Volume 239, Part E, 15 January 2022, 122385.
30. Cai, Y., A. Dahi Taleghani, 2021, Axial Fracture Initiation During Diagnostic Fracture Injection Tests and Its Impact on Interpretations, *Rock Mechanics and Rock Engineering*, 54 (11), Pp. 5845-5865.
31. Magzoub, M., Anyaezu, T., Salehi, S., Li, G., Fan, J., Teodoriu, C., Saleh, F.K. and Dahi Taleghani, A., 2021, Evaluating sealability of blended smart polymer and fiber additive for geothermal drilling with the effect of fracture opening size, *Journal of Petroleum Science and Engineering*, Volume 206, November 2021, 108998.
32. Tabatabaei, M., A. Dahi Taleghani, 2021, Shape Memory Polymers as Lost Circulation Materials for Sealing Wide-Opened Natural Fractures, *SPE Drilling & Completions*, Vol. 36 (04): 931–942.
33. Santos, L., A. Dahi Taleghani, 2021, On Quantitative Assessment of Effective Cement Bonding to Guarantee Wellbore Integrity, *ASME Journal of Energy Resources and Technology*, 144(1), p.013001.
34. Yu, H, A. Dahi Taleghani, Z. Lian, T. Lin, 2021, A New Look at Rock Mechanical Behavior from the Granular-Scale, *Journal of Petroleum Science and Engineering*, 200, p.108373.
35. Tabatabaei, M., A. Dahi Taleghani, J. Hooker, 2021, Debonding of Cemented Natural Fractures during Core Recovery To be published in: *Journal of Structural Geology*, *Journal of Structural Geology*, Volume 144, March 2021, 104272.
36. Song, Y., A. Dahi Taleghani, 2021, Numerical Simulation of Proppant Displacement in Scaled Fracture Networks, *ASME Journal of Energy Resources and Technology*, 143(4): 043004.
37. Tabatabaei, M., A. Dahi Taleghani, 2020, Nanoengineered Solution for Repairing Cement Leakage in Deep Wells, *International Journal of Greenhouse Gas Control*, Volume 103, 103187
38. Lee, L., A. Dahi Taleghani, 2020, Simulating Fracture Sealing by Granular LCM Particles in Geothermal Drilling, *Energies*, Vol. 13, p. 4878; doi:10.3390/en13184878
39. Koc, S., A. Dahi Taleghani, 2020, A Fast Method to Determine the Critical Depth of Cut for Various Rock Types, *Energies*, 13, p.4496; doi:10.3390/en13174496.

40. Tabatabaei, M., A. Dahi Taleghani, Y. Cai, L. Santos, N. Alem, 2020, Surface Modification of Proppant using Hydrophobic Coating to Enhance Long-Term Production, SPE Production & Operations, pp. 1-12, SPE-196067-PA.
41. Santos, L., A. Dahi Taleghani, G. Li, 2020, Nanosilica-Treated Shape Memory Polymer Fibers to Strengthen Wellbore cement, Journal of Petroleum Science and Engineering, 196, p.107646.
42. Tabatabaei, M., A. Dahi Taleghani, N. Alem, 2020, Nanoengineering of Cement Using Graphite Platelets to Refine Inherent Microstructural Defects, Composites Part B, 202, p.108277.
43. Fan, J., L.Y. Santos, A.D. Taleghani, and G. Li., 2020, Stimuli-responsive petroleum cement composite with giant expansion and enhanced mechanical properties, Construction and Building Materials, Vol. 259, p.119783.
44. Dahi Taleghani, A., Y. Cai, A. Pouya, 2020, Fracture Closure Modes during Flowback from Hydraulic Fractures, International Journal for Numerical and Analytical Methods in Geomechanics, 44(12), pp.1695-1704.
45. Santos, L., A. Dahi Taleghani, G. Li, 2020, Smart Expandable Fiber Additive to Prevent Formation of Microannuli, SPE Drilling & Completions, 35 (03): pp. 490-502
46. Dahi Taleghani, A., M. Ahmadi, Thermoporoelastic Analysis of Artificially Fractured Geothermal Reservoirs; a Multiphysics Problem, ASME Journal of Energy Resources and Technology, 142 (8) p.081302..
47. Yu, H, A. Dahi Taleghani, Z. Lian, 2019, On How Asymmetric Stimulated Rock Volume in Shales May Impact Casing Integrity, Energy Science & Engineering 8 (5), 1524-1540
48. Tabatabaei, M., A. Dahi Taleghani, N. Alem, 2020, Measurement of Mixed Mode Interfacial Strengths with Cementitious Materials, Engineering Fracture Mechanics, Volume 223, 106739, ISSN 0013-7944.
49. Cai Y., A. Dahi Taleghani, 2019, Semi-Analytical Model for Two-Phase Flowback in Complex Fracture Networks in Shale Oil Reservoirs, Energies, 12, 4746; doi:10.3390/en12244746
50. Tabatabaei, M., A. Dahi Taleghani, N. Alem, 2019 Surface Modified Graphite Nanoplatelets to Enhance Cement Sheath Durability, SPE-199897-PA, SPE Drilling & Completions, 35 (03) pp. 452-464.
51. Lui, K., D. Gao, A. Dahi Taleghani, Semi-Analytical Model for Fault Slippage Due to Partial Pressurization, SPE Journal, 25 (03) pp. 1489-1502..
52. Xiao, Z., Ding, W., Dahi Taleghani, A., Wang, X. , Gu, Y., 2019, Quantitative analysis of tight sandstone reservoir heterogeneity based on rescaled range analysis and empirical mode decomposition: A case study, Journal of Petroleum Science and Engineering, Volume 182, 106326.
53. Yu, H, A. Dahi Taleghani, Z. Lian, 2019, On How Pumping Hesitations May Improve Complexity of Hydraulic Fractures, A Simulation Study, Fuel, Volume 249, Pages 294-308.
54. Lui, K., A. Dahi Taleghani, D. Gao, 2019, Calculation of Hydraulic Fracture Induced Stress and Corresponding Fault Slippage in Shale Formation, Fuel, Volume 254, Article 11525.

55. Asala, H.I.J. Chebeir, M. Vidhyadhar, I. Gupta, A. Dahi-Taleghani, J. Romagnoli, 2019, An Integrated Machine Learning Approach to Shale Gas Supply Chain Optimization and Re-frac Well Candidate Identification, *SPE Reservoir Evaluation and Engineering Journal*, Volume 22, Issue 04, pp. 1201-1224.
56. Tabatabaei, M., A. Dahi Taleghani, and N. Alem, Additives to Enhance Cement Sheath Durability, *Proceedings of the ASME 2019 38th International Conference on Ocean, Offshore and Arctic Engineering*. Volume 8: Polar and Arctic Sciences and Technology; Petroleum Technology. Glasgow, Scotland, UK. June 9–14, 2019. V008T11A002. ASME.
57. Yu, H, A. Dahi Taleghani, Z. Lian, 2018, Impact of the Dogleg Geometry on Displacement Efficiency during Cementing; An Integrated Modeling Approach, *Journal of Petroleum Science and Engineering*, Volume 173, pp. 588-600.
58. Puyang, P., A. Dahi Taleghani, B. Sarker, 2018, Optimal natural fracture realizations by minimizing least squared errors of distances from microseismic events, *Journal of Applied Geophysics*, Vol. 159, pp. 294-303.
59. Lui, K., D. Gao, A. Dahi Taleghani, 2018, Analysis on Integrity of Cement Sheath in the Vertical Section of Wells during Hydraulic Fracturing, *Journal of Petroleum Science and Engineering*, Volume 168, pp. 370-379.
60. Lui, K., D. Gao, A. Dahi Taleghani, 2018, Impact of Casing Eccentricity on Cement Sheath, *Energies*, 11 (10), Page 2557.
61. Yu, H, A. Dahi Taleghani, Z. Lian, 2018, Modelling Casing Wear at Doglegs by Incorporating Alternate Accumulative Wear, *Journal of Petroleum Science and Engineering*, Volume 168, Pages 273-282.
62. Santos, L., A. Dahi Taleghani, G. Li, 2018, Expandable Proppants to Moderate Production Drop in Hydraulically Fractured Wells, *Journal of Natural Gas Science and Engineering*, Volume 55, Pages 182-190.
63. Klimenko, D., A. Dahi Taleghani, 2018, A modified extended finite element method for fluid-driven fractures; Incorporating variable primary energy loss mechanism, *International Journal of Rock Mechanics and Mining Sciences*, Volume 106, June 2018, Pages 329-341.
64. Mansour, A., A. Dahi Taleghani, S. Salehi, 2018, Smart Lost Circulation Materials for Productive Zones, *Journal of Petroleum Exploration and Production Technology*, Pages 1-16 <https://doi.org/10.1007/s13202-018-0458-z>.
65. Dahi Taleghani, A., M. Gonzalez, H. Yu, H. Asala, 2018, Numerical Simulation of Hydraulic Fracture Propagation in Naturally Fractured Formations Using The Cohesive Zone Model, *Journal of Petroleum Science and Engineering* 165, 42-57.
66. Jiang, Y., A. Dahi Taleghani, 2018, Modified Extended Finite Element Methods for Gas Flow in Fractured Reservoirs; a Pseudo-Pressure Approach, *ASME Journal of Energy Resources Technology*, 140(7), p.073101.

67. Bautista, J.F., A. Dahi Taleghani, 2017, Prediction of Damage at Water Injectors Wells in Unconsolidated Formations, *Journal of Petroleum Science and Engineering*, 164, pp.1-10.
68. Ahmadi, M., Dahi-Taleghani, A., 2017, Thermoporoelastic Analysis of a Single-well Closed-Loop Geothermal System, *American Society of Civil Engineering, Poromechanics VI*, pp. 602-609.
69. Sheikhezadei, K., Dahi-Taleghani, A., 2017, Comparative Experimental Study of Rock Cutting Under High Confining Pressure and Atmospheric Conditions Using PDC Cutter, *American Society of Civil Engineering, Poromechanics VI*, pp 1900-1908.
70. Moayedi, M., A. Dahi Taleghani, G. Li, 2017, Smart Expandable Cement Additive to Achieve Better Wellbore Integrity, *ASME. J. Energy Resour. Technol.* 2017;139(6):062903-062903-8. doi:10.1115/1.4036963.
71. Wang W., A. Dahi Taleghani, 2017, Impact of Hydraulic Fracturing on Cement Sheath Integrity; A Modelling Approach, *Journal of Natural Gas Science and Engineering* 44, 265-277.
72. Bautista, J.F., A. Dahi Taleghani, 2017, Dynamic Modeling of Injectivity Evolution in Unconsolidated Sands, *Journal of Petroleum Science and Engineering* 149, 256-269
73. Wang, W., Dahi-Taleghani, A., 2017, Emergence of Delamination Fractures around the Casing and Its Stability, *Journal of Energy Resources Technology*, Volume 39, Issue 1, Pages 012904-11. doi:10.1115/1.4033718.
74. Tabatabaei, M., Dahi-Taleghani, A., 2017, Randomly distributed interfacial arc cracks within the inclusion-inhomogeneity-matrix system, *Meccanica* 52(4), 1123-1142, DOI 10.1007/s11012-016-0442-y
75. Bautista, J.F., A. Dahi Taleghani, 2016, The state of the art and challenges in geomechanical modeling of injector wells; a review paper, *Journal of Energy Resources Technology*, 139(1) p.012910.
76. Ahmadi, M., Dahi-Taleghani, A., 2016, Impact of Thermally Reactivated Micro-Natural Fractures on Well Productivity in Shale Reservoirs, a Numerical Study , *Journal of Natural Gas Science and Engineering*, Volume 35, Part A, September 2016, Pages 583-592.
77. Puyang, P., A. Dahi Taleghani, B. Sarker, 2016, An Integrated Modeling Approach for Natural Fractures and Post Treatment Fracturing Analysis: A Case Study, *Journal of Interpretation* November-January, Vol. 4, No. 4: pp. T493-T504.
78. Ahmadi, M., Dahi-Taleghani, A., and C. Sayers, 2016, The effect of fracture roughness on fracture compliance, *Geophysical Journal International*, Volume 205, Issue 1, Pp. 454-463.
79. Bedayat, H., Dahi Taleghani, A., Anisotropic Inhomogeneous Poroelastic Inclusions; with Application to Underground Energy related Problems, *Journal of Energy Resources Technology*, Volume 138, Issue 3, 032905.
80. Dahi Taleghani, A., A. Shojaei, M. Gonzalez, 2016, Overview of Numerical Models for Interactions between Hydraulic Fractures and Natural Fractures: Challenges and Limitations, *Computers and Geotechnics*, Volume 71, January 2016, Pages 361-368.
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97. Al Balushi, F., A. Dahi Taleghani, 2023, Thermally Conductive Proppants To Improve Heat Extraction In Geothermal Systems, SPE-214824-MS presented in *SPE Annual Technical Conference & Exhibition in San Antonio, TX*.
98. Henrique, C., A. Dahi Taleghani, 2023, Does Fiber Stiffness Determine LCM Effectiveness?, SPE-214861-MS presented in *SPE Annual Technical Conference & Exhibition in San Antonio, TX*.
99. Al Shalabi, E., M. Jayaraman, A. Dahi Taleghani, 2023, Revisiting Petroleum Engineering Curriculum: Adaptation To Energy Landscape, SPE-216532-MS presented in *ADIPEC held in Abu Dhabi, UAE*.
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101. Tabatabaei M., L Santos, AA Al Hassan, A Dahi Taleghani, 2022, Limiting Deteriorative Impacts of Oil-Based Mud Residuals on Cement Bonding presented in *SPE Annual Technical Conference & Exhibition in Houston, TX*.
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106. Tabatabaei, M., A. Dahi Taleghani, 2021, Natural Low-Cost Coal-Based Additive to Improve Well Cement Integrity presented in *SPE Annual Technical Conference & Exhibition in Dubai, UAE*.
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108. Cai, Y., A. Dahi Taleghani, 2021, Effects Of Axial Fracture Closure On Dfit Results And Its Correction presented in SPE Annual Technical Conference & Exhibition in Dubai, UAE.
109. Yu, H, A. Dahi Taleghani, Z. Lian, 2021, Severe Casing Deformations In Multistage Hydraulic Fracturing Using Dual-scale Modelling Approach presented in SPE Annual Technical Conference & Exhibition in Dubai, UAE.
110. Al Balushi, F., A. Dahi Taleghani, 2020, A Fast Method to Estimate the Correlation Between Confining Stresses and Absolute Permeability of Propped Fractures presented in SPE Annual Technical Conference & Exhibition in Houston, TX.
111. Lee, L., A. Dahi Taleghani, 2020, The Effect of Particle Size Distribution of Granular Materials on Fracture Sealing Capability, presented in SPE Annual Technical Conference & Exhibition in Houston, TX.
112. Cai, Y., A. Dahi Taleghani, R. Hawkes, 2020, A Quick and Rigorous Approach for Estimating Reservoir Permeability from DFITs presented in SPE Annual Technical Conference & Exhibition in Houston, TX.
113. Tabatabaei, M., A. Dahi Taleghani, 2020, Nanoengineered Cement for More Effective Remedial Cementing Jobs presented in SPE Annual Technical Conference & Exhibition in Houston, TX.
114. Cai, Y., A. Dahi Taleghani, 2019, Pursuing improved Flowback Recovery after Hydraulic Fracturing, presented in SPE Eastern Regional Meeting in Charleston, West Virginia.
115. Yu, H, A. Dahi Taleghani, Z. Lian, T. Lin, 2019, Impact of Asymmetric Stimulated Rock Volume on Casing Deformation in Multi-stage Fracturing; A Case Study, presented in SPE Annual Technical Conference & Exhibition in Calgary, Canada.
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117. Tabatabaei, M., A. Dahi Taleghani, N. Alem, 2019, Economic Nano-additive to Improve Cement Sealing Capability, SPE-195259-MS, presented at SPE Western Regional Meeting, San Jose, CA.
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123. Mansour, A., A. Dahi Taleghani, G. Li, S. Salehi, 2017, Smart Lost Circulation Materials for Productive Zones, SPE-187099-MS presented in SPE Annual Technical Conference & Exhibition in San Antonio, TX.
124. Peyvandi, A, A. Dahi Taleghani, S. Soroushian, R. Cammatra, 2017, The Use of Low-Cost Graphite Nanomaterials to Enhance Zonal Isolation in Oil and Gas Wells, SPE-187105-MS presented in SPE Annual Technical Conference & Exhibition in San Antonio, TX.
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132. Bautista, J.F., A. Dahi Taleghani, 2016, Prediction of Formation Damage at Water Injectors Wells due to Channelization in Unconsolidated Formations, SPE-179032 presented in SPE International Conference and Exhibition on Formation Damage Control held in Lafayette, Louisiana.
133. Gonzalez, M., Dahi Taleghani, A., and P. Puyang, 2015, From Double-Cantilever Beam Test to Microseismic Maps: An Integrated Modeling Approach to Incorporate Natural Fractures Effect on Hydraulic Fracturing presented at the Unconventional Resources Technology Conference held in San Antonio, Texas, USA, 20-22 July 2015.

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146. Santos, L., A. Dahi Taleghani, 2022, Impact of Microannulus on the Performance of Closed-Loop Geothermal Systems, presented in 2022 Geothermal Rising Conference (GRC) in Reno, Nevada, August 28-31.
147. Liu, S., A. Dahi Taleghani, 2022, Numerical Study on Critical Factors Affecting Efficiency of Closed-Loop Geothermal Wells, presented in 2022 Geothermal Rising Conference (GRC) in Reno, Nevada, August 28-31.
148. Tabatabaei, M., A. Dahi Taleghani, 2022, Using Shape Memory Effects to Develop New Lost Circulation Materials to Seal Wide Fractures, presented in 2022 Geothermal Rising Conference (GRC) in Reno, Nevada, August 28-31.
149. Santos, L., A. Dahi Taleghani, 2021, Machine learning framework to generate synthetic cement evaluation logs for wellbore integrity analysis, presented in 55th US Rock Mechanics/Geomechanics Symposium held in Houston, Texas, USA, 20-23 June 2021.
150. Tabatabaei, M., A. Dahi Taleghani, 2021, Smart Lost Circulation Materials for Sealing Large Width Natural Fractures, presented in 55th US Rock Mechanics/Geomechanics Symposium held in Houston, Texas, USA, 20-23 June 2021.
151. Asadollahi, P., A. Dahi Taleghani, G. Li, 2020, Unreinforced Slurry Walls as Temporary Support of Excavation for Shafts , presented in North American Tunneling Conference, Nashville, TN.
152. Al Balushi, F., A. Dahi Taleghani, 2020, Numerical Generation of Stress-dependent Permeability Curves, 54th US Rock Mechanics/Geomechanics Symposium held in Golden, Colorado, USA, 28 June-1 July 2020.
153. Lee, L., A. Dahi Taleghani, 2020, Looking at Fracture Sealing Mechanisms by Granular LCM at Elevated Temperatures, presented at S, 45th Workshop on Geothermal Reservoir Engineering Stanford University, Stanford, California, February 10-12, 2020 SGP-TR-216
154. Santos, L., A. Alghamdi, A. Dahi Taleghani, 2019, Experimental Evaluation of the Impact of Oil-Based Mud Residuals on Cement-Formation Bonding Strength, presented in AADE National Technical Conference and Exhibition held April 9-10 in Denver, Colorado.
155. Yu, H., A. Dahi Taleghani, 2018, Coupled Modeling Of Complex Fracture Networks Induced During Hydraulic Fracturing Treatments, presented in 80th Annual conference of European Association of Geoscientists and Engineers.
156. Chebeir, J., Asala, H., Dahi-Taleghani, A., Romagnoli, J., 2017, The Application of Reservoir Simulation to the Optimization of Shale Gas Supply Chain Design and its Water Management Structure, Proceedings of the 27th European Symposium on Computer Aided Process Engineering, Vol. 40, 1st Edition, pp. 1435-1440, ISBN:9780444639707
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159. Chebeir, J., Asala, H., Dahi-Taleghani, A., Romagnoli, J., 2017, The Application of Reservoir Simulation to the Optimization of Shale Gas Supply Chain Design and its Water Management Structure,

- Proceedings of the 27th European Symposium on Computer Aided Process Engineering, Barcelona, Spain, Oct. 1-5.
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 162. Tabatabaei, M., Dahi-Taleghani, A., 2016, Partial Annular Cracks Around Cemented Casing Interfaces, ARMA 16-0218, 50th US Rock Mechanics / Geomechanics Symposium held in Houston, TX, USA.
 163. Ahmadi, M., Dahi-Taleghani, A., 2016, Feasibility Study of Heat Extraction from a Closed-loop Fractured Geothermal Reservoir; a Multiphysics problem, ARMA 16-0538, 50th US Rock Mechanics / Geomechanics Symposium held in Houston, TX, USA.
 164. Bautista, J.F., A. Dahi Taleghani, 2016, The State of the Art and Challenges in Geomechanical Modeling of Injector Wells; A Review Paper, presented in OMAE ASME Conference, held in Busan South Korea.
 165. Shojaei, A., A. Dahi Taleghani, 2015, A Continuum Damage Model with Application for Hydraulic Fractures Interaction with Natural Fractures, presented at 13th International Congress on Rock Mechanics (ISRM), Montréal, Canada.
 166. Shojaei, A., A. Dahi Taleghani, 2015, A Continuum Damage Model to Predict Bit Performance Based on Single Cutter Experiments, presented at 13th International Congress on Rock Mechanics (ISRM), Montréal, Canada.
 167. Dahi Taleghani, A., 2014, Overview of Models for Interactions Between Hydraulic Fractures and Natural Fractures: Challenges and Limitations, presented in International Conference on Recent Advances in Numerical Simulation of Hydraulic Fracture, held in Rzeszow, Poland, 14-16 July 2014.
 168. Rostami, S., A. Dahi Taleghani, 2014, Modeling particle mobilization in unconsolidated formations due to fluid injection, at the 48th US Rock Mechanics/ Geomechanics Symposium held in Minnesota, USA.
 169. Bedayat, H. and Taleghani, A., 2013, The Equivalent Inclusion Method for Poroelasticity Problems. *Poromechanics V*: pp. 1279-1288, doi: 10.1061/9780784412992.153
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 171. Wang, W., Dahi Taleghani, A., 2012, Emergence and Propagation of Delamination Cracks along the Casing-Cement Interface, the 46th US Rock Mechanics / Geomechanics Symposium held in Chicago, IL, USA.
 172. Bedayat, H., A. Dahi Taleghani , 2012, Drainage of Poroelastic Fractures and Its Implications on the Performance of Naturally Fractured Reservoirs, ARMA 12-562 at the 46th US Rock Mechanics / Geomechanics Symposium held in Chicago, IL, USA.
 173. Rahmani, R., Smith, J.R., Dahi Taleghani, Analytical Modeling of PDC Single Cutter-Rock Interaction Under Confining pressure, ARMA 12-341 at the 46th US Rock Mechanics / Geomechanics Symposium held in Chicago, IL, USA.
 174. Dahi Taleghani, A., 2011, Modeling Simultaneous Growth of Multi-branch Hydraulic Fractures. In 45th US Rock Mechanics/Geomechanics Symposium.

175. Dahi Taleghani, A., 2010, Fracture Re-Initiation as a Possible Branching Mechanism during Hydraulic fracturing, ARMA annual symposium, Salt Lake city, UT.
176. Sayers, C. M., J. Adachi, A. Dahi Taleghani, The effect of near-wellbore yield on elastic wave velocities in sandstones, SEG Annual Meeting Las Vegas, 2008.

Conferences without Proceedings

177. Dahi Taleghani, 2020, Smart Expandable Fiber Additive to Improve Zonal Isolation in Geothermal Wells GRC-SPE Workshop: High-Temperature Well Cementing and Well Integrity, September 14-16, 2020 in San Diego, Ca.
178. Dahi Taleghani, A., 2017, On Modeling Sand Production in Water Injectors Operating in Unconsolidated Formations, presented in 2017 Deepwater Technical Symposium to be held on August 22 – 23, 2017 in New Orleans, LA.
179. Gonzalez-Chavez, M.A., Dahi Taleghani, A., 2016, Numerical Simulation of Hydraulic Fracture Propagation in Naturally Fracture Formations Using Cohesive Elements, South-Central Section, The Geological Society of America (GSA) 50th Annual Meeting, 21-22 March, Baton Rouge, LA, USA.
180. Klimenko, D., Dahi Taleghani, A., 2016, Hydraulic Fracturing Modeling by Utilizing Improved Extended Finite Element Method, South-Central Section, The Geological Society of America (GSA) 50th Annual Meeting, 21-22 March, Baton Rouge, LA, USA.
181. Ahmadi, M., Dahi Taleghani, A., 2016, Feasibility Study of Heat Extraction from a Closed-Loop Fractured Geothermal Reservoir; A Multiphysics Problem, South-Central Section, The Geological Society of America (GSA) 50th Annual Meeting, 21-22 March, Baton Rouge, LA, USA.
182. Watkins, T.L., Lorenzo, J., Dahi Taleghani, A., 2016, On Microseismic Events Associated with Fluid-Filled Fracture Propagation in Close Proximity to a Natural Fault, South-Central Section, Geological Society of America (GSA) 50th Annual Meeting, 21-22 March, Baton Rouge, LA, USA.
183. Bautista, J.F., A., Dahi Taleghani, 2015, Injectivity Changes During Injection in Poorly Consolidated Formations, presented in 2015 Deepwater Technical Symposium to be held on August 18 – 20, 2015 in New Orleans, LA.
184. Kilimenko, D., A., Dahi Taleghani, 2015, An Improved Extended Finite Element Method for Hydraulic Fracturing Propagation, 13th US National Congress on Computational Mechanics (USNCCM), July 26-30, San Diego, CA
185. Dahi Taleghani, A. and J.M. Lorenzo, 2014, Laboratory Experiments on Wave Emissions Generated by the Variable Viscosity of Fracturing Fluids, AGU Fall Meeting, 15-19 December, San Francisco, California.
186. Lorenzo J.M., A. Dahi Taleghani, 2014, Using Intermediate-Field Terms in Locating Microseismic Events, AGU Fall Meeting, 15-19 December, San Francisco, California.
187. Ahmadi, M., Dahi-Taleghani, A., 2014, Changes in Fracture Compliance Due to Roughness, AGU Fall Meeting, 15-19 December, San Francisco, California.
188. Gonzalez, M., A. Dahi-Taleghani, 2014, Influence of Natural Fractures Cohesive Properties on Geometry of Hydraulic Fracture Networks, AGU Fall Meeting, 15-19 December, San Francisco, California.
189. Shojaei, A., Dahi Taleghani, A., Interaction Analysis between Hydraulic Fractures and Natural Fractures, SIMULIA South Regional User Meeting October 21, 2014
190. Dahi Taleghani A., 2011, Fractures Interactions in Multistage Hydraulic Fracturing, presented at the AAPG 2011 Annual Convention & Exhibition in Houston, Texas, USA.

191. Olson, J., A. Dahi Taleghani, 2010, The Influence of Natural Fractures on Hydraulic Fracture Propagation, April 2010, AAPG Annual meeting, New Orleans, LA.
192. Colin M. Sayers, J. Adachi, A. Dahi Taleghani, 2008, The seismic response of partially mineralized fractures, presented in SEG Rock Physics Research Workshop, Galway, Ireland, 2008.

Book Chapters

193. Dahi-Taleghani, A. and H. Yu, 2022, Advances in Geomechanical Modelling, Unconv Shale Gas Development Lessons, In production by Elsevier.
194. Dahi-Taleghani, A. and L. Santos, 2021, Application of shape memory polymers in the oil & gas industry, Encyclopedia of Materials: Plastics and Polymers, Reference Module in Materials Science and Materials Engineering, Elsevier, ISBN 9780128035818, <https://doi.org/10.1016/B978-0-12-820352-1.00189-9>.
195. Dahi-Taleghani, A. and M. Ahmadi, 2013, Secondary Fractures and Their Potential Impacts on Hydraulic Fractures Efficiency, chapter in Effective and Sustainable Hydraulic Fracturing edited by Robert Jeffrey, published by InTech ISBN 980-953-307-651-0.

DEPARTMENTAL AND UNIVERSITY SERVICE

- Penn State EME Department, Chair of Qualifying Exams Committee, 2023-2024.
- Elected to Penn State EMS College, Promotion and Tenure Committee 2023-2026.
- Elected to Penn State EME Department, Promotion and Tenure Committee 2018-2020.
- Elected to Penn State EME Department, Faculty Annual Evaluation Committee, 2018, 2019.
- EMS College, Chair of Academic Integrity Committee, 2020-2021.
- EMS College, Academic Integrity Committee, 2018-2020.
- Penn State EME Department Graduate Studies Committee, 2017-2019.
- Penn State EME Department Lab Space and Allocation Committee, 2017-2019.
- Penn State EME department Undergraduate Studies Committee, 2017-2019.
- Elected to the LSU faculty Senate from College of Engineering, 2016.
- Elected to College Policy Committee at LSU College of Engineering, 2016.
- Search Committee, Department of Petroleum Engineering, LSU, 2010–2012.
- Faculty advisor for American Rock Mechanics (ARMA) chapter at LSU, 2012.
- Graduate Studies Examination Policy Committee, 2010.

STUDENTS SUPERVISED (GRADUATED)

Main Advisor (Co-Advisor *)

- Lu Lee (PhD) PennState,
- Yuzhe Cai (PhD, Chevron) PennState,
- Salih Koc (MS, Turkish Petro. Co.) PennState,
- Faras Albalushi (MS, PSU PhD) PennState,
- Houman Bedayat (PhD, Convergent Tech.) LSU,
- Milad Ahmadi (PhD, Chevron) LSU,
- Miguel Gonzalez (PhD, PEMEX) LSU,
- Amir Shoajei (Postdoc, Halliburton) LSU
- Volkan Kanat (M.E., Turkish Oil Co.) LSU
- Ting Tan*(PhD, Halliburton) LSU
- Wei Wang (PhD, Shell) LSU
- Ahmed Mansour (MS, CSM PhD) LSU
- Guanzhou Chen (MS) PennState
- Livio Santos (PhD) PennState
- Yibo Song (MS, Northwestern U.) PennState
- Kian Sheikhezadei* (PhD, NOV) LSU
- Mehdi Moayedi (MS, Halliburton) LSU
- Ping Puyang (MS, Concho Resources) LSU
- Trudy Watkins* (MS, Occidental) LSU
- Livio Santos (MS, Penn State) LSU
- Juan Bautista (MS, EXA Co.) LSU
- S. Rostami-Ameen (MS, Weatherford) LSU
- Chennu Fan (MS, U. of Min.) LSU

STUDENTS SUPERVISING (CURRENT)

- Rui Wang (PhD student)
- Cassian Henrique (PhD student)
- Sai Liu (PhD student)
- Maryam Tabatabaei (Ass. Research Prof.)
- Qitao Zhang (PhD student)
- Faras Albalushi (PhD student)
- Livio Santo (Postdoc)

OTHER PROFESSIONAL ACTIVITIES

Referee	AAPG Bulletin, Journal of Energy Resources and Technology, SPE Journal, Journal of Petroleum Science and Technology, Journal of Transport in Porous media, Journal of Numerical and Analytical Methods in Geomechanics, Int. Journal of Fracture, Engineering Fracture Mechanics, Water Resources, Journal of Geophysical research, Geophysics, Int. Journal of Rock Mechanics and Mining Sciences, Energies, Geophysics Review Letters, European Journal of Environmental and Civil Engineering, Geophysical research Letters
Conference Topic Organizer	ASME OMAE 2014-2019, ARMA 2017, Wellbore Stimulation SPE ATCE 2017-2019
Reviewer	National Science Foundation, American Chemistry Society, Department of Energy, Society of Petroleum Engineers
Membership	Society of Petroleum Engineers, American Rock Mechanics Association, American Association of Petroleum Geologists, Society of Exploration Geophysics, American Association of Mechanics Engineers

REFERENCES

Available upon request.

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