Mohsen Ahmadian, Ph.D.

Professional Summary

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Business address:	The University of Texas at Austin Bureau of Economic Geology 10100 Burnet Rd., Bldg. 130 Austin, TX 78758
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Professional Preparation

Academic Background

Ph.D. Biochemistry/Cell Regulation, University of Texas Southwestern Medical Center, Dallas, Texas, August 1996

MSc. Microbiology, University of North Texas, Denton, Texas, December 1990

BSc. Biology/Chemistry, University of North Texas, Denton, Texas, August 1988

Professional Appointments

Principal, Advanced Energy Consortium, Bureau of Economic Geology (BEG), The University of Texas at Austin (UT-Austin) (October 2022-Present)

Program Manager, Bureau of Economic Geology at The University of Texas at Austin (July 2021-Present)

Project Manager & Scientist, Bureau of Economic Geology, and Advanced Energy Consortium (2010-Present)
o In charge of large scale demonstration pilot studies for contrast-agent-assisted reservoir imaging concepts for the Advanced Energy Consortium (AEC)
o Managed over $20M portfolio of cutting-edge research projects that are being conducted at leading academic institutions in collaboration with the Advanced Energy Consortium (AEC) member companies. The member companies have historically included Baker Hughes, BG Group, BP America, Inc., Conoco Philips, Halliburton, Marathon, Oxy, Petrobras, Repsol, Schlumberger, Shell, Statoil, and Total.
o Directed over 15 research projects involving scientists at leading US-based and European academic institutions, including at Harvard, BU, Northwestern, UT, Rice, UNC, TNO, OU, RTI and ARL.
o Liaised with the AEC's technical advisory committee to set project milestones and ensure on time execution of deliverables.
o Managing the AEC's Nano-metrology lab, which is focused on unified metrology and characterization of magnetic nanoparticles that are intended to be used as contrast agents in conjunction with electromagnetic geophysical tools in waterflood and hydraulic fracture mapping applications.
o Development of best practices for AEC through organizing webinars, workshops, online newsletter, and conducting site visits with PI teams and member companies.

Co-Principal Investigator, Advanced Energy Consortium, Bureau of Economic Geology (BEG), The University of Texas at Austin (July 2018-October 2022)

Senior Staff Applications Engineer and Project Manager, KLA-Tencor Corporation, San Jose, California; Portland, Oregon; and Austin, Texas (1997-2010)
o Project manager and customer liaison supporting applications, engineering and marketing

groups covering 18 accounts across multiple regions in North America as well as Asia and Europe
o Oversight of projects for multimillion-dollar laser- and ebeam-enhanced capital equipment, robotics, simulation and classifier software to enable process monitoring and improvement at leading wafer and photomask manufacturing sites
o Responsible for coordinating, configuring, delivering, and tracking new and existing customers

Postdoctoral Fellow, Hamon Center for Teherapeutic Oncology Research (1996 - 1997). Collaborative research to identify and analyze putative recessive genes on chromosome 3p in breast, lung, and cervical cancers; research emphasis on understanding of differential expression of targeted markers and genes in preneoplastic lesions from pair samples or familial cases; research led to cloning of breast cancer homozygous deletion junction, narrowing region of search for a 3p21.3 tumor suppressor gene.

Dissertations

Molecular Mechanisms Regulating Protein Phosphatase 2A

Areas of Expertise

Areas of Expertise

Geosciences

Life Sciences

Nanotechnology

Oil & Gas Exploration

Semiconductor Equipment

Awards

Awards and Honorary Societies

o Qualification for Ph.D. degree with a committee that included two Nobel laureates
o Group Business Achievement Award at KLA-Tencor
o Twice recipient of General Manager's Award at KLA-Tencor
o Glaxo Wellcome Oncology Scholar Research Award
o NCI Postdoctoral Fellowship Award
o Sigma Xi Award for Outstanding Graduate Research
o Co-Chair, International Oilfield Nanotechnology Conference, SPE, Nanotechnology for Oil and Gas, Noordwijk, the Netherlands, June 12-14, 2012, 1996-2016

Service

External Committees Participation

Co-Chair, International Oilfield Nanotechnology Conference, SPE, Nanotechnology for Oil and Gas, Noordwijk, the Netherlands, June 12-14, 2012

Published Interviews

Rassenfoss, S., and Ahmadian, M., 2016, Electromagnetic imaging offers first look at the propped rock, Journal of Petroleum Technology; March interview with Ahmadian by JPT Emerging Technology Senior Editor.

Presentations

Invited Presentations

Nanotech and Contrast Agents for Enhanced Mapping of Fracture Networks: presented to Sandia National Laboratories and US DOE, presented at Shales at All Scales: Exploring Coupled Processes, Santa Fe, New Mexico, June 9-11, 2015.

Micro and Nano Scale Sensors for Oil Exploration and Production: presented to SPE, presented at SPE Workshop: Reservoir Nanoagents: Taming Complexities On Road to Deployment, Dubai, UAE, February 24-26, 2014.

Keynote Address: Nanotechnologies - A Competitive Edge: presented to Marcus Evans Conference, presented at Enhanced Oil RecoveryTechnology & Innovation Forum, London, February 25-27, 2013.

Presentations

Electrical and Magnetic Imaging of Proppants in Shallow Hydraulic Fractures: presented to AGU, San Francisco, December 14-16, 2015.

The Advanced Energy Consortium: Nanotechnologies Solutions for the Oil and Gas Industry: presented to TechConnect, presented at TechConnect World Innovation Conference, Washington, DC, June 14-17, 2015.

Publications

Peer Reviewed Journal Articles

Haddad, M., Ahmadian, M., Ge, J., Nicot, J.-P., and Ambrose, W., 2023, Geomechanical and hydrogeological evaluation of a shallow hydraulic fracture at the Devine Fracture Pilot Site, Medina County, Texas: Rock Mechanics and Rock Engineering, v. 56, no. 10, p. 7049-7069, http://doi.org/10.1007/s00603-022-03115-z.

Zhang, R., Sun, Q., Cui, L., Jia, Y., Huang, W.-F., Ahmadian, M., and Liu, Q. H., 2022, Accelerating hydraulic fracture imaging by deep transfer learning: IEEE Transactions on Antennas and Propagation, v. 70, no. 7, p. 6117-6121, http://doi.org/10.1109/TAP.2022.3161325.

Beskardes, G. D., McAliley, W. A., Ahmadian, M., Chapman, D. T., Weiss, C. J., and Heath, J. E., 2019, Power density distribution in subsurface fractures due to an energized steel well-casing source: Journal of Environmental and Engineering Geophysics, v. 24, no. 2, p. 285-297, http://doi.org/10.2113/JEEG24.2.285.

Fei, Y., Iqbal, M., Kong, S. D., Xue, Z., McFadden, C. P., Guillet, J. L., Doerrer, L. H., Alp, E. E., Bi, W., Lu, Y., Dandamudi, C. B., Rangananth, P. J., Javier, K. J., Ahmadian, M., Ellison, C. J., and Johnston, K. P., 2018, Aqueous superparamagnetic magnetite dispersions with ultrahigh initial magnetic susceptibilities: Langmuir, v. 34, no. 2, p. 622-629, http://doi.org/10.1021/acs.langmuir.7b03702.

Fei, Y., Iqbal, M., Kong, S. D., Xue, Z., McFadden, C. P., Guillet, J. L., Doerrer, L. H., Alp, E. E., Bi, W., Lu, Y., Dandamundi, C. B., Ranganath, P. J., Javier, K. J., Ahmadian, M., Ellison, C. J., and Johnston, K. P., 2018, Aqueous superparamagnetic magnetite dispersions with ultrahigh initial magnetic susceptibilities: Langmuir, v. 34, no. 2, p. 622-629, http://doi.org/10.1021/acs.langmuir.7b03702.

Yoon, K. Y., Xue, Z., Fei, Y., Lee, J. H., Cheng, V., Bagaria, H. G., Huh, C., Bryant, S. L., Kong, S. D., Ngo, V. W., Rahman, A.-R., Ahmadian, M., Ellison, C. J., and Johnston, K. P., 2016, Control of magnetite primary particle size in aqueous dispersions of nanoclusters for high magnetic susceptibilities: Journal of Colloid and Interface Science, v. 462, p. 359-367, http://doi.org/10.1016/j.jcis.2015.09.058.

Rahmani, A. R., Bryant, S., Huh, C., Athey, A., Ahmadian, M., Chen, J., and Wilt, M., 2015, Crosswell magnetic sensing of superparamagnetic nanoparticles for subsurface applications: Society of Petroleum Engineers Journal, v. 20, no. 5, p. 1067-1082, http://doi.org/10.2118/166140-PA.

Non Peer Reviewed Journal Articles

Ahmadian, M., and Haddad, M., 2023, Pressure Transient Analyses and Poroelastic Modeling of

Hydraulic Fracture Dilation for Multiple Injections at the Devine Fracture Pilot Site: OnePetro, no. SPE-212362-MS, http://doi.org/10.2118/212362-MS.

Ahmadian, M., Haddad, M., and others, 2023, Real-Time Monitoring of Fracture Dynamics with a Contrast Agent-Assisted Electromagnetic Method: OnePetro, no. SPE-212376-MS, http://doi.org/10.2118/212376-MS.

Wright, A., Cashion, A., Ahmadian, M., and others, 2022, Downhole Smart Collar Technology for Wireless Real-Time Fluid Monitoring: GRC Transactions, v. 46, no. SAND2022-7050C.

Dewers, T., Taha, M. R., Stormont, J., Pyrak-Nolte, L., Ahmadian, M., and others, 2021, Advanced Downhole Acoustic Sensing for Wellbore Integrity (Final Report): OSTI, http://doi.org/10.2172/1866200.

Ahmadian, M., LaBrecque, D., Liu, Q. H., and others, 2019, Validation of the utility of the contrast-agent-assisted electromagnetic tomography method for precise imaging of a hydraulically induced fracture network: OnePetro, no. SPE-196140-MS, http://doi.org/10.2118/196140-MS.

Ahmadian, M., LaBrecque, D., and others, 2018, Demonstration of proof of concept of electromagnetic geophysical methods for high resolution illumination of induced fracture networks: OnePetro, no. PE-189858-MS, http://doi.org/10.2118/189858-MS.

Dogan, M., Moysey, S. M., Murdoch, L. C., Ahmadian, M., and Denison, J. L. S., 2017, Investigating the Capabilities of Ground Penetrating Radar for Imaging Shallow Experimental Fractures: AGU.

Ahmadian, M., Chapman, D., Nelson-Thomas, C., Kipper, J. P., and Tinker, S. W., 2016, Nanotechnology solutions for the oil and gas industry: SPE: The Way Ahead, https://www.spe.org/en/twa/twa-article-detail/?art=683.

LaBrecque, D., Brigham, R., Denison, J., Murdoch, L., Slack, W., Liu, Q. H., Fang, Y., Dai, J., Hu, Y., Yu, Z., Kleinhammes, A., Doyle, P., Wu, Y., and Ahmadian, M., 2016, Remote imaging of proppants in hydraulic fracture networks using electromagnetic methods: results of small-scale field experiments: SPE Journal, no. SPE-179170-MS, 16 p., http://doi.org/10.2118/179170-MS.

Rahmani, A. R., Bryant, S. L., Huh, C., Ahmadian, M., Zhang, W., and Liu, Q. H., 2015, Characterizing reservoir heterogeneities using magnetic nanoparticles: SPE, no. 173195-MS, 29 p., http://doi.org/doi:10.2118/173195-MS.

Ahmadian, M., Chapman, D., Murphy, S. C., Kipper, J. P., and Tinker, S. W., 2014, The Advanced Energy Consortium: an international team of interdisciplinary researchers developing a portfolio of nano-technologies for the oil and gas industry: Brazilian Petroleum, Gas and Biofuels Institute (IBP), no. IBP2274_14, 11 p.

Rahmani, A. R., Bryant, S., Huh, C., Athey, A., Ahmadian, M., Chen, J., and Wilt, M., 2013, Crosswell magnetic sensing of superparamagnetic nanoparticles for subsurface applications: SPE Annual Technical Conference and Exhibition, 30 September-2 October, New Orleans, La., USA, no. SPE-166140-MS, 16 p.

Conference Proceedings

Haddad, M., and Ahmadian, M., 2024, Interpretation of DAS-based slow strain for monitoring of hydraulic-fracture reopening during multiple injection cycles at the Devine Fracture Pilot Site, Unconventional Resources Technology Conference (URTeC), Houston, Texas, USA, 19 p.

Ahmadian, M., Haddad, M., Cui, L., Kleinhammes, A., Doyle, P., Chen, J., Pugh, T., Liu, Q.-H., Wu, Y., and Mohajeri, D., 2023, Real-Time Monitoring of Fracture Dynamics with a Contrast Agent-Assisted Electromagnetic Method, The SPE Hydraulic Fracture Technology Conference (HFTC), The Woodlands, Tex.

Haddad, M., and Ahmadian, M., 2023, Pressure Transient Analyses and Poroelastic Modeling of Hydraulic Fracture Dilation for Multiple Injections at the Devine Fracture Pilot Site, The SPE Hydraulic Fracture Technology Conference (HFTC), The Woodlands, Tex.

Haddad, M., Ahmadian, M., Ge, J., Hosseini, S. A., Nicot, J.-P., and Ambrose, W. A., 2021, Hydrogeological and Geomechanical Evaluation of a Shallow Hydraulic Fracture at the Devine Fracture Pilot Site, Medina County, Texas, 55th U.S. Rock Mechanics/Geomechanics Symposium, online.

Ahmadian, M., LaBrecque, D., Liu, Q. H., Kleinhammes, A., Doyle, P., Fang, Y., Paine, J. G., and Costard, L., 2019, Validation of the utility of contrast-agent-assisted electromagnetic tomography method for precise imaging of a hydraulically induced fracture network, Society of Petroleum Engineers, SPE Annual Technical Conference and Exhibition, 30 September, Calgary, Canada, SPE-196140-MS.

Ahmadian, M., LaBrecque, D., Liu, Q. H., Slack, W., Brigham, R., Fang, Y., Banks, K., Hu, Y., and Zhang, R., 2018, Demonstration of proof of concept of electromagnetic geophysical methods for high resolution illumination of induced fracture networks, Society of Petroleum Engineers, SPE Hydraulic Fracturing Technology Conference and Exhibition, 23-25 January, The Woodlands, Texas, USA-SPE-189858, 17 p.

Published Abstracts

Rahmani, A. R., Athey, A. E., Ahmadian, M., Chen, J., Wilt, M. J., Bryant, Steve, and Huh, C., 2013, Crosswell magnetic sensing of superparamagnetic nanoparticles for subsurface applications (abs.): Society of Petroleum Engineers Annual Technical Conference and Exhibition, New Orleans, Louisiana, USA, 30 September-2 October 2013, SPE Paper 166140.