



## Anthony Kavscek

Keelen and Carlton Beal Professor of Petroleum Engineering  
Energy Science & Engineering

### Bio

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#### ACADEMIC APPOINTMENTS

- Professor, Energy Science & Engineering
- Affiliate, Precourt Institute for Energy

#### ADMINISTRATIVE APPOINTMENTS

- Chair, Energy Resources Engineering, (2012-2018)
- Professor of Energy Science & Engineering, Stanford University, (2022- present)
- Professor of Energy Resources Engineering, Stanford University, (2010-2022)
- Associate Professor of Energy Resources Engineering, Stanford University, (2006-2010)
- Associate Professor of Petroleum Engineering, Stanford University, (2003-2006)
- Assistant Professor of Petroleum Engineering, Stanford University, (1996-2003)
- Postdoctoral Scholar, Earth Sciences Division, Lawrence Berkeley National Laboratory, (1994-1996)

#### HONORS AND AWARDS

- Member, U.S. National Academy of Engineering (2023)
- John Franklin Carll Award for Distinguished Contributions to Engineering, Society of Petroleum Engineers (2021)
- Keelen and Carlton Beal Professorship, Stanford University (2015)
- Lester C Uren Award for Distinguished Achievement, Society of Petroleum Engineers (2015)
- Distinguished Member, Society of Petroleum Engineers (2015)
- Distinguished Lecturer. Carbon Sequestration, Global Climate and Energy Project, Stanford University (2008)
- SPE Distinguished Achievement Award for Petroleum Engineering Faculty, Stanford University (2006)
- School of Earth Sciences Award for Excellence in Teaching, Stanford University (1997-1998)
- Tau Beta Pi, Univ. of Washington (1988)

#### BOARDS, ADVISORY COMMITTEES, PROFESSIONAL ORGANIZATIONS

- Chair of Energy Resources Engineering, Stanford University (2012 - 2018)
- Breadth Governance Board, Ways of Thinking and Doing, Stanford University (2012 - 2014)
- Codirector of SCCS, Stanford Center for Carbon Storage Affiliates, Stanford University (2011 - present)
- Chair, Faculty Search Committee Energy Resources Engineering, Stanford University (2011 - 2011)
- Invited Speaker, China University of Petroleum, Beijing China (2011 - 2011)

- Technical Program Committee, SPE Western Regional Meeting, Society of Petroleum Engineers (2011 - 2011)
- Cochair of Steering Committee, SPE Forum, Digital Rocks: Realizing Step Change in the Value of Laboratory Data (2010 - 2011)
- Invited Speaker: Department of Chemical Engineering, University of California at Santa Barbara, et al. (2010 - 2010)
- Technical Program Committee, SPE Western Regional Meeting, Society of Petroleum Engineers (2010 - 2010)
- Invited Speaker, Department of Petroleum and Geosystems Engineering, University of Texas and Chemical Engineering and Materials Science, University of Southern California (2009 - 2009)
- Executive Editor, SPE Journal, Society of Petroleum Engineers (2009 - 2012)
- Associate Chairman, Energy Resources Engineering, Stanford University (2008 - 2011)
- Chair, Faculty Search Committee, Energy Resources Engineering, Stanford University (2008 - 2008)
- Marshall, 117th Commencement June 15, Stanford University (2008 - 2008)
- Technical Program Committee, SPE Western Regional Meeting, Society of Petroleum Engineers (2008 - 2009)
- Organizing Committee, SPE Forum, Maximizing Oil Recovery in the 21st Century, Colorado Springs, CO., Society of Petroleum Engineers (2008 - 2009)
- Society of Petroleum Engineers, Books Development Committee, Society of Petroleum Engineers (2008 - 2009)
- Technical Program Committee, SPE Western Regional Meeting, Society of Petroleum Engineers (2007 - 2008)
- Member, Faculty Search Committee, Energy Resources Engineering, Stanford University (2007 - 2007)
- SPE Publications Coordinating Committee, Society of Petroleum Engineers (2007 - 2008)
- Steering Committee, 6th Annual Conference on Carbon Capture and Sequestration, Pittsburg, PA, Conference on Carbon Capture and Sequestration (2007 - 2007)
- Editorial Board, SPE Reservoir Evaluation & Engineering, Society of Petroleum Engineers (2006 - 2009)
- Member, American Geophysical Union (AGU), American Geophysical Union (2006 - present)
- Member, Energy Committee, Woods Institute for the Environment at Stanford University (2005 - present)
- Chair, Energy Resources Engineering Admissions Committee, Stanford University (2005 - present)
- Chair of Steering Committee, SPE Forum, Enhanced Oil Recovery: What's Next?, Society of Petroleum Engineers (2005 - 2006)
- Invited Speaker, BP Anchorage, AK, and ExxonMobil Research and Engineering Co. Clinton, NJ (2005 - 2005)
- Steering Committee Member, 4th Annual Conference on Carbon Capture and Sequestration, Alexandria, VA, Conference on Carbon Capture and Sequestration (2005 - 2005)
- SPE Western Regional Meeting Program Committee and Session Chair, Society of Petroleum Engineers (2005 - 2005)
- Freshman Advisor, Stanford University (2004 - 2008)
- Marshall, 113th Commencement, June 13, Stanford University (2004 - 2004)
- Invited Speaker: Petroleum Technology Transfer Council, SPE Advanced Technology Workshop on Reservoir Physics, Gordon Research Conference--Flow and Transport in Permeable Media, Society of Petroleum Engineers (2004 - 2004)
- Journal of Petroleum Technology, Editorial Committee, Journal of Petroleum Technology (2004 - present)
- Chair, SPE Continuing Education Committee, Society of Petroleum Engineers (2004 - 2005)
- Invited Speaker: Department of Chemical Engineering, University of California, Berkeley., University of California, Berkeley, PetroChina, Beijing China, Aera Energy LLC, Bakersfield, CA (2003 - 2003)
- Organizer, ACS Award in Colloid Chemistry Symposium Honoring Clayton J. Radke, American Chemical Society (2003 - 2003)
- Editor of a Special Issue of the Journal of Petroleum Science and Engineering honoring Professor W. E. Brigham, Journal of Petroleum Science and Engineering (2003 - 2003)
- Member, Faculty Search Committee, Petroleum Engineering, Stanford University (2002 - 2003)
- Invited Speaker: Department of Civil Engineering, University of California, Berkeley, Huainan Institute of Technology, Anhui China, University of California, Berkeley and Huainan Institute of Technology, Anhui China (2002 - 2002)
- Session Chairman: SPE/DOE Improved Oil Recovery Symposium, Society of Petroleum Engineers and Department of Energy (2002 - 2002)
- Invited Speaker, Petroleum Technology Transfer Council (2001 - 2001)

- Invited Panelist, DOE Multiscale Reservoir Investigation Symposium, Organizer SPE Western Region Student Paper Contest, Department of Energy and Society of Petroleum Engineers (2001 - 2001)
- Faculty Search Committee, Geological and Environmental Sciences, Stanford University (2000 - 2000)
- Member, Earth Systems Advisory Committee, Stanford University (2000 - present)
- Invited Speaker, Chevron Petroleum Technology Co. (2000 - 2000)
- Technical Editor, SPE Reservoir Engineering and Evaluation (2000 - 2006)
- Member, Continuing Education Committee, SPE, Society of Petroleum Engineers (2000 - present)
- Technical Program Committee/Session Chairman: SPE/DOE Improved Oil Recovery Symposium, SPE Western Regional Meeting, Society of Petroleum Engineers and Department of Energy (2000 - 2000)
- Instructor, Stanford Science and Engineering Academy (1999 - 1999)
- Speaker, The President's Fund Dinner, Stanford University (1999 - 1999)
- Faculty Advisor, SPE student chapter, Stanford University (1998 - present)
- Member, Petroleum Engineering Department Admissions Committee, Stanford University (1998 - 2002)
- Invited speaker, Mobil Technology Company, Imperial Oil Resources (1998 - 1998)
- Session Chairman: SPE/DOE 11th Symposium on Improved Oil Recovery, 7th UNITAR Conference on Heavy Crude Oil, Society of Petroleum Engineers and Department of Energy (1998 - 1998)
- Freshman and Sophomore advisor, Stanford University (1997 - 2003)
- Organizing Committee: Stanford and Heriot Watt University Forum on Reservoir Description and Modeling, Stanford University and Heriot Watt University (1997 - 1997)
- Member, American Chemical Society (1997 - present)
- Chairman, Petroleum Engineering Department Safety Committee, Stanford University (1996 - 2008)
- Member, School of Earth Sciences Faculty Library Committee, Stanford University (1996 - present)
- Member, Society of Petroleum Engineers (1994 - present)

## PROFESSIONAL EDUCATION

- Ph.D., Univ. of California, Berkeley Chemical Engineering (1994)
- B.S., Univ. of Washington, Chemical Engineering (1989)

## LINKS

- SUETRI-A: <https://suetri-a.github.io>
- Google Scholar Profile: <https://scholar.google.com/citations?hl=en&user=CQ1koU8AAAAJ>
- Center for Mechanistic Control of Unconventional Formations (CMC-UF): <https://efrc-shale.stanford.edu>

## Research & Scholarship

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### CURRENT RESEARCH AND SCHOLARLY INTERESTS

#### Research

Together with my research group, I develop and apply advanced imaging techniques, experimentation, and models to understand complex multiphase flows of gas, water, and organic phases in natural and manufactured porous media with applications in carbon storage, increased utilization of carbon dioxide for subsurface applications, hydrogen storage, and water reuse. In all of our work, physical observations, obtained mainly from laboratory and field measurements, are interwoven with theory.

#### Teaching

My teaching interests center broadly around education of students to meet the energy challenges that we will face this century. I teach undergraduate courses that examine the interplay of energy use and environmental issues including renewable energy resources and sustainability. At the graduate level, I offer classes on renewable energy processes based on heat and the thermodynamics of hydrocarbon mixtures.

#### Professional Activities

Member, American Geophysical Union, Society of Petroleum Engineers, and the American Chemical Society.

## Teaching

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### COURSES

#### 2024-25

- Busting Energy Myths: ENERGY 30N (Aut)
- ESE Master's Graduate Seminar: ENERGY 351 (Spr)
- ESE PhD Graduate Seminar: ENERGY 352 (Spr)
- Fundamentals of Energy Processes: EE 293B, ENERGY 201B (Win)
- Fundamentals of Renewable Power: EARTHSYS 102, ENERGY 102 (Spr)
- Senior Project and Seminar in Energy Science and Engineering: ENERGY 199 (Spr)

#### 2023-24

- Busting Energy Myths: ENERGY 30N (Aut)
- Fundamentals of Energy Processes: EE 293B, ENERGY 201B (Win)
- Fundamentals of Renewable Power: EARTHSYS 102, ENERGY 102 (Spr)
- Senior Project and Seminar in Energy Science and Engineering: ENERGY 199 (Spr)
- Thermodynamics of Equilibria: ENERGY 251 (Aut)

#### 2022-23

- Busting Energy Myths: ENERGY 30N (Win)
- ERE Master's Graduate Seminar: ENERGY 351 (Spr)
- ERE PhD Graduate Seminar: ENERGY 352 (Spr)
- Fundamentals of Energy Processes: EE 293B, ENERGY 293B (Win)
- Fundamentals of Renewable Power: EARTHSYS 102, ENERGY 102 (Spr)
- Senior Project and Seminar in Energy Resources: ENERGY 199 (Spr)

#### 2021-22

- Busting Energy Myths: ENERGY 30N (Aut)
- ERE Master's Graduate Seminar: ENERGY 351 (Win)
- ERE PhD Graduate Seminar: ENERGY 352 (Win)
- Fundamentals of Energy Processes: EE 293B, ENERGY 293B (Win)
- Fundamentals of Renewable Power: EARTHSYS 102, ENERGY 102 (Spr)
- Senior Project and Seminar in Energy Resources: ENERGY 199 (Spr)
- Thermodynamics of Equilibria: ENERGY 251 (Aut)

## STANFORD ADVISEES

### Doctoral Dissertation Reader (AC)

Priyanka Muhunthan

### Postdoctoral Faculty Sponsor

Laura Froute, Arash Kamali Asl

### Doctoral Dissertation Advisor (AC)

Yunan Li, Manju Pharkavi Murugesu, Yulman Perez Claro

### Master's Program Advisor

Fatimah AlNasser, Jeff Edsall, Zitong Huang, Oluwatobi Raji

### Doctoral (Program)

Catherine Callas, Geo Zhang, Jimin Zhou

## Publications

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### PUBLICATIONS

- **Scale translation yields insights into gas adsorption under nanoconfinement** *PHYSICS OF FLUIDS*  
Liu, L., Froute, L., Kavscek, A. R., Aryana, S. A.  
2024; 36 (7)
- **Criteria and workflow for selecting saline formations for carbon storage** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*  
Callas, C., Davis, J., Saltzer, S. D., Hashemi, S. S., Wen, G., Gold, P. O., Zoback, M. D., Benson, S. M., Kavscek, A. R.  
2024; 135
- **The 11th Society of Petroleum Engineers Comparative Solution Project Problem Definition** *SPE JOURNAL*  
Nordbotten, J. M., Ferno, M. A., Flemisch, B., Kavscek, A. R., Lie, K.  
2024; 29 (5): 2507-2524
- **Molecular Assessment of Storage Capacity and Enthalpy of Adsorption in Organic-Rich Shale Gas Reservoirs** *ARABIAN JOURNAL FOR SCIENCE AND ENGINEERING*  
Afangwu, C., Glatz, G., Alafnan, S., Raza, A., Mahmoud, M. A., Sultan, A., Kavscek, A. R.  
2024
- **A Methodology for Fueling Mobility Markets with Hydrogen from Natural Gas plus Carbon Capture and Sequestration** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*  
Okoroafor, E. R., Bracci, J., Boness, N. L., Saltzer, S. D., Shrimali, G., Hennessy, E. M., Kim, T., Seamon, A., Benson, S. M., Zoback, M. D., Kavscek, A. R.  
2024; 133
- **In Situ pH Measurement in Microfluidic Porous Media Indicated by Surfaces Functionalized with Polyaniline (PAni)** *COLLOIDS AND INTERFACES*  
Zhang, G., Nazari, N., Kavscek, A. R.  
2024; 8 (1)
- **Scaling Up FluidFlow Results for Carbon Dioxide Storage in Geological Media** *TRANSPORT IN POROUS MEDIA*  
Kavscek, A. R., Nordbotten, J. M., Ferno, M. A.  
2024
- **Coupled Transport, Reactivity, and Mechanics in Fractured Shale Caprocks** *WATER RESOURCES RESEARCH*  
Murugesu, M. P., Vega, B., Ross, C. M., Kurotori, T., Druhan, J. L., Kavscek, A. R.  
2024; 60 (1)
- **Induced Seismicity Hazard Assessment for a Potential CO<sub>2</sub> Storage Site in the Southern San Joaquin Basin, CA** *GEOHAZARDS*  
Kohli, A., Li, Y., Kim, T., Kavscek, A. R.

2023; 4 (4): 421-436

- **Evaluation of Electron Tomography Capabilities for Shale Imaging.** *Microscopy and microanalysis : the official journal of Microscopy Society of America, Microbeam Analysis Society, Microscopical Society of Canada*  
Frouté, L., Boigné, E., Jolivet, I. C., Chaput, E., Creux, P., Ihme, M., Kavscek, A. R.  
2023
- **Assessing the impact of dip angle on carbon storage in saline reservoirs to aid site selection** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*  
Callas, C., Kavscek, A. R., Benson, S. M.  
2023; 129
- **Core-scale numerical simulation and comparison of breakdown of shale and resulting fractures using sc-CO<sub>2</sub> and water as injectants** *GAS SCIENCE AND ENGINEERING*  
Yang, J., Tchelepi, H. A., Kavscek, A. R.  
2023; 118
- **Assessing the impact of dip angle on carbon storage in saline reservoirs to aid site selection** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*  
Callas, C., Kavscek, A. R., Benson, S. M.  
2023; 129
- **Intercomparison of numerical simulation models for hydrogen storage in porous media using different codes** *ENERGY CONVERSION AND MANAGEMENT*  
Okoroafor, E., Sampaio, L., Gasanzade, F., Claro, Y., Zhou, J. D., Saltzer, S. D., Bauer, S., Kavscek, A. R.  
2023; 292
- **Analysis of gas storage and transport in Eagle Ford shale using pressure pulse decay measurements with He, Kr and CO<sub>2</sub>** *GEOENERGY SCIENCE AND ENGINEERING*  
Lyu, Y., Elkady, Y., Kavscek, A. R., Jessen, K.  
2023; 228
- **Scoring, ranking, and technoeconomics of carbon capture and storage opportunities in the central valley of California** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*  
Kim, T., Yaw, S., Kavscek, A. R.  
2023; 128
- **Micro X-ray fluorescence reveals pore space details and spatially-resolved porosity of rock-based microfluidic devices.** *Lab on a chip*  
Frouté, L., Guan, K. M., Yun, W., Lewis, S. J., Stripe, B. D., Yang, X., Lapene, A., Kavscek, A. R., Creux, P.  
2023
- **Environmental impact of solution pH on the formation and migration of iron colloids in deep subsurface energy systems.** *The Science of the total environment*  
Spielman-Sun, E., Bland, G., Wielinski, J., Frouté, L., Kavscek, A. R., Lowry, G. V., Bargar, J. R., Noël, V.  
2023: 166409
- **Quantification of the Impact of Acidified Brine on Fracture-Matrix Transport in a Naturally Fractured Shale Using in Situ Imaging and Modeling** *ENERGY & FUELS*  
Zahasky, C., Murugesu, M., Kurotori, T., Sutton, C., Druhan, J. L., Vega, B., Benson, S. M., Kavscek, A. R.  
2023
- **Flow characteristics and regime transition of aqueous foams in porous media over a wide range of quality, velocity, and surfactant concentration** *PETROLEUM SCIENCE*  
Li, B., Zhang, M., Li, Z., Kavscek, A., Xin, Y., Li, B.  
2023; 20 (2): 1044-1052
- **Comparative Analysis of Imaging and Measurements of Micrometer-Scale Fracture Aperture Fields Within a Heterogeneous Rock Using PET and X-ray CT** *TRANSPORT IN POROUS MEDIA*  
Kurotori, T., Zahasky, C., Gran, M., Kavscek, A. R., Benson, S. M.  
2023

- **Pore-scale study of microbial hydrogen consumption and wettability alteration during underground hydrogen storage** *FRONTIERS IN ENERGY RESEARCH*  
Liu, N., Kavscek, A. R., Ferno, M. A., Dopffel, N.  
2023; 11
- **The motion of long bubbles in microchannels using a meter-long, rectangular capillary on a chip.** *Journal of colloid and interface science*  
Nazari, N., Yun, W., Kavscek, A. R.  
2023; 638: 149-160
- **Multimodal study of the impact of stimulation pH on shale pore structure, with an emphasis on organics behavior in alkaline environments** *FUEL*  
Medina-Rodriguez, B. X., Froust, L., Alvarado, V., Kavscek, A. R.  
2023; 331
- **Mixed imbibition controls the advance of wetting fluid in multiscale geological media** *Advances in Water Resources*  
Kurotori, T., Murugesu, M. P., Zahasky, C., Vega, B., Druhan, J. L., Benson, S. M., Kavscek, A. R.  
2023
- **Effects of Supercritical CO<sub>2</sub> Injection on the Shale Pore Structures and Mass Transport Rates** *ENERGY & FUELS*  
Medina, B. X., Kohli, A., Kavscek, A. R., Alvarado, V.  
2022
- **Dynamic development of geochemical reaction fronts during hydraulic stimulation of shale** *APPLIED GEOCHEMISTRY*  
Noel, V., Druhan, J. L., Gundogar, A., Kavscek, A. R., Brown Jr, G. E., Bargar, J. R.  
2023; 148
- **Criteria and workflow for selecting depleted hydrocarbon reservoirs for carbon storage** *APPLIED ENERGY*  
Callas, C., Saltzer, S. D., Davis, J., Hashemi, S. S., Kavscek, A. R., Okoroafor, E. R., Wen, G., Zoback, M. D., Benson, S. M.  
2022; 324
- **Toward underground hydrogen storage in porous media: Reservoir engineering insights** *INTERNATIONAL JOURNAL OF HYDROGEN ENERGY*  
Okoroafor, E., Saltzer, S. D., Kavscek, A. R.  
2022; 47 (79): 33781-33802
- **Pore level foam generation in the presence of residual oil in porous media** *FUEL*  
Almajid, M. M., Kavscek, A. R.  
2022; 324
- **A micro-scale rheometer to study foam texture and flow resistance in planar fractures.** *Lab on a chip*  
Nazari, N., Kavscek, A. R.  
2022
- **Probing multiscale dissolution dynamics in natural rocks through microfluidics and compositional analysis.** *Proceedings of the National Academy of Sciences of the United States of America*  
Ling, B., Sodwatana, M., Kohli, A., Ross, C. M., Jew, A., Kavscek, A. R., Battiato, I.  
2022; 119 (32): e2122520119
- **Long-term permeability evolution of shale seal rocks with argon and scCO<sub>2</sub>** *JOURNAL OF NATURAL GAS SCIENCE AND ENGINEERING*  
Karnali-Asl, A., Kavscek, A. R., Zoback, M. D.  
2022; 104
- **Optimization and uncertainty quantification of in situ combustion chemical reaction models** *FUEL*  
Anderson, T. I., Kavscek, A. R.  
2022; 319
- **Chemical and Reactive Transport Processes Associated with Hydraulic Fracturing of Unconventional Oil/Gas Shales.** *Chemical reviews*  
Jew, A. D., Druhan, J. L., Ihme, M., Kavscek, A. R., Battiato, I., Kaszuba, J. P., Bargar, J. R., Brown, G. E.  
2022
- **Mechanistic modeling and measurement of foamed gas flow resistance in fractures** *ADVANCES IN WATER RESOURCES*  
Nazari, N., Almajid, M. M., Kavscek, A. R.

2022; 162

- **Analysis and comparison of in-situ combustion chemical reaction models** *FUEL*  
Anderson, T., Kovscek, A. R.  
2022; 311
- **Assessment of oil and gas fields in California as potential CO<sub>2</sub> storage sites** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*  
Kim, T., Callas, C., Saltzer, S. D., Kovscek, A. R.  
2022; 114
- **Fractal Characterization of Multimodal, Multiscale Images of Shale Rock Fracture Networks** *ENERGIES*  
Vega, B., Kovscek, A. R.  
2022; 15 (3)
- **Pore-scale bubble population dynamics of CO<sub>2</sub>-foam at reservoir pressure** *INTERNATIONAL JOURNAL OF GREENHOUSE GAS CONTROL*  
Benali, B., Foyen, T. L., Alcorn, Z., Haugen, M., Gauteplass, J., Kovscek, A. R., Ferno, M. A.  
2022; 114
- **Striving to translate shale physics across ten orders of magnitude: What have we learned?** *EARTH-SCIENCE REVIEWS*  
Mehmani, Y., Anderson, T., Wang, Y., Aryana, S. A., Battiato, I., Tchelepi, H. A., Kovscek, A. R.  
2021; 223
- **Reconstructing porous media using generative flow networks** *COMPUTERS & GEOSCIENCES*  
Guan, K. M., Anderson, T. I., Creux, P., Kovscek, A. R.  
2021; 156
- **2D-to-3D image translation of complex nanoporous volumes using generative networks.** *Scientific reports*  
Anderson, T. I., Vega, B., McKinzie, J., Aryana, S. A., Kovscek, A. R.  
2021; 11 (1): 20768
- **Pore-merging methodology for reactive transport and mineral dissolution in pore-network models** *ADVANCES IN WATER RESOURCES*  
Esteves, B. F., Lage, P. C., Couto, P., Kovscek, A. R.  
2021; 155
- **In-Situ Combustion Frontal Stability Analysis** *SPE JOURNAL*  
Zhu, Z., Liu, Y., Liu, C., Kovscek, A.  
2021; 26 (4): 2271-2286
- **Multiphysics Investigation of Geochemical Alterations in Marcellus Shale Using Reactive Core-Floods** *ENERGY & FUELS*  
Gundogar, A. S., Ross, C. M., Jew, A. D., Bargar, J. R., Kovscek, A. R.  
2021; 35 (13): 10733-10745
- **Multimodal Visualization of Vaca Muerta Shale Fabric Before and After Maturation** *ENERGY & FUELS*  
Guan, K. M., Ross, C. M., Kovscek, A. R.  
2021; 35 (11): 9550-9560
- **Mechanistic foam flow model with variable flowing foam fraction and its implementation using automatic differentiation** *ADVANCES IN WATER RESOURCES*  
Almajid, M. M., Wong, Z., Kovscek, A. R.  
2021; 150
- **Phase-field modeling of rate-dependent fluid-driven fracture initiation and propagation** *INTERNATIONAL JOURNAL FOR NUMERICAL AND ANALYTICAL METHODS IN GEOMECHANICS*  
Yang, J., Tchelepi, H. A., Kovscek, A. R.  
2021
- **A Critical Review of the Physicochemical Impacts of Water Chemistry on Shale in Hydraulic Fracturing Systems.** *Environmental science & technology*  
Khan, H. J., Spielman-Sun, E., Jew, A. D., Bargar, J., Kovscek, A., Druhan, J. L.  
2021
- **RockFlow: Fast Generation of Synthetic Source Rock Images Using Generative Flow Models** *ENERGIES*



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- Anderson, T. I., Guan, K. M., Vega, B., Aryana, S. A., Kavscek, A. R.  
2020; 13 (24)
- **Multimodal imaging and machine learning to enhance microscope images of shale** *COMPUTERS & GEOSCIENCES*  
Anderson, T., Vega, B., Kavscek, A. R.  
2020; 145
  - **A Critical Review of the Role of Thin Liquid Films for Modified Salinity Brine Recovery Processes** *CURRENT OPINION IN COLLOID & INTERFACE SCIENCE*  
Guo, H., Nazari, N., Esmailzadeh, S., Kavscek, A. R.  
2020; 50
  - **Multiscale study of CO<sub>2</sub> impact on fluid transport and carbonate dissolution in Utica and Eagle Ford shale** *JOURNAL OF PETROLEUM SCIENCE AND ENGINEERING*  
Elkady, Y., Kavscek, A. R.  
2020; 195
  - **Three-Dimensional Imaging and Quantification of Gas Storativity in Nanoporous Media via X-rays Computed Tomography** *ENERGIES*  
Elkady, Y., Lyu, Y., Jessen, K., Kavscek, A. R.  
2020; 13 (23)
  - **Transport Simulations on Scanning Transmission Electron Microscope Images of Nanoporous Shale** *ENERGIES*  
Froute, L., Wang, Y., McKinzie, J., Aryana, S. A., Kavscek, A. R.  
2020; 13 (24)
  - **Application of Digital Volume Correlation to X-ray Computed Tomography Images of Shale** *ENERGY & FUELS*  
Kim, T., Yun, W., Kavscek, A. R.  
2020; 34 (11): 13636–49
  - **Pore-network modeling of single-phase reactive transport and dissolution pattern evaluation** *ADVANCES IN WATER RESOURCES*  
Esteves, B. F., Lage, P. C., Couto, P., Kavscek, A. R.  
2020; 145
  - **Effect of Pressure on Crude-Oil Kinetics During In Situ Combustion** *ENERGY & FUELS*  
Yoo, K., Trujillo Portillo, M., Patino Ramirez, C., Sampaio, L., Gerritsen, M., Kavscek, A. R.  
2020; 34 (10): 12103–17
  - **Deep learning for automated characterization of pore-scale wettability** *ADVANCES IN WATER RESOURCES*  
Yun, W., Liu, Y., Kavscek, A. R.  
2020; 144
  - **Population-balance modeling of CO<sub>2</sub> foam for CCUS using nanoparticles** *JOURNAL OF NATURAL GAS SCIENCE AND ENGINEERING*  
Eide, O., Ferno, M., Bryant, S., Kavscek, A., Gauteplass, J.  
2020; 80
  - **Permeability and Porosity Evolution of Organic-Rich Shales from the Green River Formation as a Result of Maturation** *SPE JOURNAL*  
Kim, T., Ross, C. M., Guan, K. M., Burnham, A. K., Kavscek, A. R.  
2020; 25 (3): 1377–1405
  - **Thermal Imaging To Visualize and Characterize Combustion Fronts in Porous Media** *INDUSTRIAL & ENGINEERING CHEMISTRY RESEARCH*  
Yoo, K., Sampaio, L., Amanam, U., Gerritsen, M., Kavscek, A. R.  
2020; 59 (5): 2181–91
  - **Spontaneous fingering between miscible fluids** *COLLOIDS AND SURFACES A-PHYSICOCHEMICAL AND ENGINEERING ASPECTS*  
Song, W., Ramesh, N. N., Kavscek, A. R.  
2020; 584
  - **Investigation of the Effects of Select Metal Nanoparticles on Heavy Oil Combustion in Porous Media** *ENERGY & FUELS*  
Amanam, U. U., Yoo, K., Castanier, L., Kavscek, A. R.  
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