



Bolivia Vega

Research Engineer, Energy Science & Engineering

Bio

CURRENT ROLE AT STANFORD

Research Engineer at the Energy Science & Engineering Department

Executive Director of the Center for Mechanistic Control of Unconventional Formations (CMC-UF)

Professional

PROFESSIONAL INTERESTS

My work is currently focused on the use of imaging as a tool to characterize tight porous media. My imaging efforts toggle from nano, to micro and meso characterization using optical and X-ray imaging techniques to achieve insightful knowledge on the rock-fluid behavior of these systems. The overarching objective is to bridge scales from the nano resolution scaled images obtained from my experiments at SLAC, to micro-scale resolved at the SNSF facilities, to meso-scale imaging performed with medical CT scanners.

PROFESSIONAL AFFILIATIONS AND ACTIVITIES

- SPE Membership Committee, SPE (2016 - 2019)
- SPE Section and Chapter Activities Committee Chair, SPE (2015 - 2016)
- SPE Section and Chapter Activities Committee, SPE (2014 - 2015)
- SPE Section Director I, SPE Golden Gate Section (2013 - 2014)
- SPE Section Chair, SPE Golden Gate Section (2012 - 2013)
- SPE Western Regional Meeting Co-chair, SPE Western Regional Meeting (2012 - 2013)
- SPE Section Vice-chair, SPE Golden Gate Section (2011 - 2012)
- SPE Section Secretary and Webmaster, SPE Golden Gate Section (2008 - 2011)

Publications

PUBLICATIONS

- **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., Kovalscek, A. R.
2024; 60 (1)
- **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., Kovalscek, A. R.
2023

- **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
- **Nano-imaging of Diatomite with Transmission X-ray Microscope** *Album of Porous Media: Structure and Dynamics*
Vega, B., Kavscek, A. R.
Springer International Publishing.2023: 113
- **Study of Stress Field and Fracture Network Development With Rock Analogs** *Album of Porous Media: Structure and Dynamics*
Vega, B., Kavscek, A. R.
Springer International Publishing.2023: 89
- **Fractal Characterization of Multimodal, Multiscale Images of Shale Rock Fracture Networks** *ENERGIES*
Vega, B., Kavscek, A. R.
2022; 15 (3)
- **2D-to-3D image translation of complex nanoporous volumes using generative networks.** *Scientific reports*
Anderson, T. I., Vega, B., McKinzie, J., Aryana, S. A., Kavscek, A. R.
2021; 11 (1): 20768
- **RockFlow: Fast Generation of Synthetic Source Rock Images Using Generative Flow Models** *ENERGIES*
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
- **Investigation of Stress Field and Fracture Development During Shale Maturation Using Analog Rock Systems** *TRANSPORT IN POROUS MEDIA*
Vega, B., Yang, J., Tchepeli, H., Kavscek, A. R.
2019
- **A systematic study of internal gas generation in shale source rocks using analog experiments** *JOURNAL OF PETROLEUM SCIENCE AND ENGINEERING*
Vega, B., Kavscek, A. R.
2019; 173: 209–21
- **Detecting Opal-CT Formation Resulting from Thermal Recovery Methods in Diatomites.** *SPE Western Regional Meeting*
Ross, C. M., Vega, B., Peng, J., Ikeda, M., Lagasca, J. R., Tang, G., Kavscek, A. R.
2016
- **Imaging-Aided Study of Relative Permeability Response to Temperature in Diatomaceous Rocks** *SPE Western Regional Meeting*
Vega, B., Kavscek, A. R.
2015
- **Imaging-Based Characterization of Calcite-Filled Fractures and Porosity in Shales** *SPE Journal*
Vega, B., Ross, C. M., Kavscek, A. R.
2015
- **Steady-State Relative Permeability Measurements, Temperature Dependency and a Reservoir Diatomite Core Sample Evolution** *SPE Annual Technical Conference and Exhibition*
Vega, B., Kavscek, A. R.
2014
- **CT Imaging of Low Permeability, Dual Porosity Systems Using High X-Ray Contrast Gas** *Transport in Porous Media*
Vega, B., Dutta, A., Kavscek, A. R.
2014; 101 (1): 81-97
- **Nanoscale visualization of Gas Shale Pore and Textural Features** *Unconventional Resources Technology Conference*
Vega, B., Andrews, J., Liu, Y., Gelbs, J., Kavscek, A. R.
2013

- **Thermally Induced Fracture Reconsolidation of Diatomite Under No Flow Conditions** *SPE Western Regional Meeting*
Vega, B., Tang, G., Kovscek, A. R.
2011
- **The Effect of Temperature and Oil Viscosity Reduction on Water Imbibition of Diatomite** *SPE Western Regional Meeting*
Vega, B., Kovscek, A. R.
2010
- **Experimental Investigation of Oil Recovery From Siliceous Shale by Miscible CO2 Injection** *SPE Annual Technical Conference and Exhibition*
Vega, B., O'Brien, W. J., Kovscek, A. R.
2010
- **Storage of Greenhouse Gases in Oil and Gas Reservoirs** *Developments and innovation in carbon capture and storage (CCS) technology*
Kovscek, A. R., Vega, B.
Woodhead Publishers.2009
- **Experimental Investigation of Oil Recovery From Siliceous Shale by CO2 Injection** *SPE Annual Technical Conference and Exhibition*
Vega, B., Kovscek, A. R., Tang, G.
2008
- **Relative Permeability Curves for Solution Gas Drive in Heavy Oils** *X Colombian Oil Congress*
Vega, B.
2003
- **Treatment of Waste Water/Oil Emulsions Using Microwave Radiation** *SPE Health, Safety and Environment Conference*
Vega, C., Delgado, M., Vega, B.
2002