Stanford

Bolivia Vega

Research Engineer, Department of Energy Resources Engineering - Energy Resources Engineering

Bio

CURRENT ROLE AT STANFORD

Research Engineer at the Energy Resources 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.

I am also involved in experimental investigation of enhanced oil recovery methods (such as CO2 or hot water injection) targeted at low permeability resources. My research explores the impact of different variables related to the recovery method (such as temperature, injection mode, miscibility conditions, injected fluid) and/or rock properties and how these are altered (wettability, porosity and permeability) and how they affect the effectiveness of the total oil recovered. Experiments usually involve CT scan imaging of the samples during the processes and the use of simulator-based models to represent and duplicate experimental results

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

- **RockFlow: Fast Generation of Synthetic Source Rock Images Using Generative Flow Models** *ENERGIES*

Anderson, T. I., Guan, K. M., Vega, B., Aryana, S. A., Kovscek, A. R.
2020; 13 (24)

- **Multimodal imaging and machine learning to enhance microscope images of shale** *COMPUTERS & GEOSCIENCES*
  Anderson, T., Vega, B., Kovscek, 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., Tchelepi, H., Kovscek, 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., Kovscek, 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., Kovscek, A. R.
  2016
- **Imaging-Aided Study of Relative Permeability Response to Temperature in Diatomaceous Rocks** *SPE Western Regional Meeting*
  Vega, B., Kovscek, A. R.
  2015
- **Imaging-Based Characterization of Calcite-Filled Fractures and Porosity in Shales** *SPE Journal*
  Vega, B., Ross, C. M., Kovscek, 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., Kovscek, 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., Kovscek, 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., Kovscek, 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