

SEG/SPE/SPWLA Workshop: From Measurement to Theory: Adventures in Rock Physics, Petrophysics, and Engineering
Honoring the Contributions of Professor Carl H. Sondergeld
27–29 March 2024, Norman, Oklahoma

Technical Program

Presentations will take place in the University of Oklahoma Thurman J. White Forum Building — oral presentations in Conference Room A and posters in Rooms A2/A4/A6.

Wednesday 27 March 2024		
Time	Presentation	Presenters*
7:30–8:30	Registration and Breakfast Buffet	
8:30-8:45	Welcome and Introduction	<i>Co-Chairs: Ronny Hofmann, Shell; Joe Comisky, Devon Energy; Mark Proett, Retired</i>
8:45-9:30	<i>Carl's Life</i>	<i>Chandra Rai, Mewbourne School of Petroleum and Geological Engineering, The University of Oklahoma</i>
9:30-12:15	Session 1: Petrophysical Characterization	
9:30-9:55	Organic Matter, Porosity, and Gas Production in the Marcellus Shale	<i>L. Taras Bryndzia*¹, R. Hofmann² (1. Independent Geoscientist, 2. SIEP Inc.)</i>
9:55-10:20	Review of Gas Injection EOR in Unconventional Reservoirs: From the Optimization of Injection-Production to the Understanding of Main Drive Mechanism	<i>Son Dang*¹, C. Rai¹, C. Sondergeld¹ (Mewbourne School of Petroleum and Geological Engineering, The University of Oklahoma)</i>
10:20-10:45	Enhancing Oil Recovery from Fractured Reservoirs with a Wettability Modifier	<i>Luis E. Zerpa*¹, A. Siddique¹ (1. Colorado School of Mines)</i>
10:45-11:00	BREAK	
11:00-11:25	Microseismic Evolution, Fault Reactivation, and Stress Heterogeneity of Crustal Faults at Pawnee, Oklahoma	<i>Segun S. Bodunde*¹, J. Jiang¹ (1. School of Geosciences, The University of Oklahoma)</i>
11:25-11:50	New Dynamic Measurements for Permeability from the Reservoir to Core Scale	<i>Mark Proett*¹ (1. Mark Proett Consulting LLC)</i>
11:50-12:15	Multi-Scale Characterization for Unconventional Reservoir Interpretation: Realizing Improved Geophysical and Geomechanical Integration	<i>Mark G. Kittridge*¹, S. Plitzuweit¹, J. Estrada¹, S. Olgiati¹, J. Kessler (1. Occidental Petroleum Corporation)</i>
12:30-13:30	Lunch Sponsored by NuTech Energy	
13:30-16:00	Session 2: Rock Physics	
13:30-13:55	Estimating Elastic Moduli of Solid Organic Matter in Unconventional Reservoirs	<i>Paritosh Bhatnagar*¹, L. Vernik² (1. Ikon Science, 2. University of Houston)</i>
13:55-14:20	New Method of XRF/XRD Based Mineralogy for Estimating Matrix-Bulk-Modulus, Biot's-Coefficient, and Effective-Stress Using VRH and HS Bounds Models of Rock Physics and Petrophysics	<i>Umesh Prasad*¹, N. Alarcon¹ (1. Baker Hughes)</i>
14:20-14:45	Rock Physics AVO Inversion Using Gauss-Newton Optimization with Analytical Derivatives	<i>Jorlivan Correa*¹, D. Grana² (1. Petrobras, 2. University of Wyoming)</i>
14:45-15:10	Integration of Rock Physics Models in Seismic Petrophysical Inversion Using Bayesian Physics Informed Neural Networks	<i>Peng Li*¹, D. Grana, M. Liu (1. University of Wyoming)</i>
15:10-15:35	Machine Learning Application for Joint Rock Physics Model Optimization, Facies Classification, and Compaction Modeling	<i>Gabriela D'Aubeterre*¹, R. Filograsso¹, A. Snowling¹ (1. Ikon Science)</i>
15:35-16:00	Multi-Ensemble Bayesian Analysis to Determine the Rock-Physics Model with the Highest Probabilistic Fit	<i>Kyle T. Spikes*¹, M. Sen (1. The University of Texas at Austin)</i>
16:00-16:30	BREAK	
16:30-18:00	Session 3: Poster Session	<i>3 rounds of 20-minute presentations with 2-minute introductions before each round</i>
	Combined X-Ray and Electrical Resistivity Tomography to Quantify Capillary-Pressure Effects During Mud-Filtrate Invasion	<i>Mohamad Abdo*¹, C. Torres-Verdin¹ (1. The University of Texas at Austin)</i>
	Effective Elastic Properties of Composite Granular Rocks Using Particulate Discrete Element Modelling	<i>Prasad Pothana*¹, F. Garcia², K. Ling¹ (1. Department of Energy and Petroleum Engineering, University of North Dakota, 2. Civil and Environmental Engineering, University of Michigan)</i>
	Advancing Reservoir Characterization in Clay-Rich, Thin Bedded Clastic Reservoirs through the Extended Thomas-Stieber Model	<i>Tariq Saihood*¹, M. Myers¹, L. Hathon¹ (1. Rock Mechanics, Petrophysics, and Sample Characterization Laboratory, University of Houston)</i>
	Vertical Permeability Estimation in Multilayer Anisotropic Reservoirs in the Natih Formation, Oman	<i>Adeyemi A. Adetosoye*¹, C. Johnson¹ (1. Occidental Petroleum Corporation)</i>
	Natural Fractures in the Niobrara Formation, Redtail-East Pony Field Areas, Denver Basin, Colorado	<i>Stephen A. Sonnenberg*¹, C. Matson¹ (1. Colorado School of Mines)</i>
	Early EUR Indicator for Permian Basin Unconventional Resources Based on Hourly Flowback Data	<i>Xueying Xie*¹, S. Liu¹, C. Leiker¹ (1. Occidental Petroleum Corporation)</i>
	Hydromechanical Impacts of Rock Layer Heterogeneity on Poroelastic Deformation and Fluid Flow in Geothermal Fields: A 3D Finite-Element Modeling Approach	<i>Ganiyat Shodunke*¹, J. Jiang¹, S. Bodunde¹ (1. Department of Geosciences, The University of Oklahoma)</i>
	Seal-Leakage Analysis and Forward Modeling of a CO ₂ Sequestration Site	<i>Maureen James*¹, M. Prasad¹ (1. Department of Geophysics, Colorado School of Mines)</i>
	Multiparameter Statistical Rock-Physics Simulations for Igneous Rocks Intercalated with Subsalt Carbonate Reservoirs	<i>Vitor Mello*¹, K. Spikes¹ (1. Jackson School of Geosciences, The University of Texas)</i>
18:00–19:00	Networking Reception: Thurman J. White Forum Building	

Thursday 28 March 2024		
Time	Presentation	Presenters*
7:30–8:20	Breakfast Buffet	
8:20–8:30	Welcome	Co-Chair: Ronny Hofmann
8:30-12:30	Session 4: Characterization and Image Based Petrophysics	
8:30-8:55	A Novel Technique for Determination of Formation Water Salinity Through Ionic Exchange	Abdelali Guezei* ¹ , S. Mamoudou ¹ , S. Dang ¹ , C. Rai ¹ (1. Mewbourne School of Petroleum and Geological Engineering, The University of Oklahoma)
8:55-9:20	Integration of Mercury Injection Capillary Pressure Derived Properties for Improved Prediction of Reservoir Performance	James Greene* ¹ , K. Newsham ¹ , M. Pavlovic ¹ (1. NuTech Energy)
9:20-9:45	Rapid Characterization of Quantitative Mineralogy Using FTIR Analysis	Rieko Adriaens* ¹ , G. Mertens ¹ , B. Paredis ¹ (1. Qmineral Analysis & Consulting)
9:45-10:10	Characterizing Variable Pore Systems in a Heterogeneous Carbonate Reservoir (Lower Habshan) in UAE: Using Multiple Data Collection Approaches	Sweta Bose* ¹ , J. Moreno ¹ (1. Occidental Petroleum Corporation)
10:10-10:30	BREAK	
10:30-10:55	Small Things with Huge Impact: 15 Years of Learnings from Imaging Shale Microstructure	Mark E. Curtis* ¹ (1. The University of Oklahoma)
10:55-11:20	Elastic Properties Derived Directly from SEM Images in Unconventional Plays	Deepak Devegowda* ¹ , H. Yang ¹ , M. Curtis ¹ , C. Rai ¹ , C. Sondergeld ¹ (1. Mewbourne School of Petroleum and Geological Engineering, The University of Oklahoma)
11:20-11:45	Estimating the Impact of Clay Conductivity on the Electrical Properties of Shaly Sands Using Digital Rock Physics	Bochao Zhao* ¹ , R. Hofmann ¹ , J. Freeman ¹ (1. Shell International E&P)
11:45-12:10	Petrophysical Properties from Images	Ronny Hofmann* ¹ , N. Saxena ¹ , J. Freeman ¹ (1. Shell International E&P)
12:30-13:30	Lunch Sponsored by Ikon Science and Devon Energy	
13:30-16:00	Session 5: NMR and Measurements	
13:30-13:55	Overview of NMR/MRI of Rocks	Michael Dick* ¹ , T. Kenney ¹ , D. Veselinovic ¹ , D. Green ¹ (1. Green Imaging Technologies)
13:55-14:20	Practical Applications for NMR Core Analysis	Michael Dick* ¹ , T. Kenney ¹ , D. Veselinovic ¹ , D. Green ¹ (1. Green Imaging Technologies)
14:20-14:45	Understanding Non-Exponential Characteristics of NMR Responses from Unconventional Source Rocks and Impacts to Core Analysis	Z. Harry Xie* ¹ (1. Core Laboratories)
14:45-15:10	NMR Interpretation in Unconventional Reservoirs: Application to QC/Guide for Log Calculated Total Water Saturations in the Texas Delaware Basin	Jing Li* ¹ , M. Pavlovic ¹ (1. Occidental Petroleum Corporation)
15:10-15:35	Investigating Rock Anisotropy Effects on Acoustic and Electrical Properties through Angle-Dependent Measurements	Domenico Crisafulli* ¹ , D. Olszowska, C. Torres-Verdin (1. The University of Texas at Austin)
15:35-16:00	Comparative Experimental Study of Ultrasonic Attenuation Measurements in H ₂ and CO ₂ -Saturated Fontainebleau Sandstones	Gabriel C. Unomah* ¹ , M. Myers ¹ , D. Myers ² , L. Hathon ¹ , J. Adolrazzag ³ , R. Stewart ³ (1. Department of Petroleum Engineering, University of Houston, 2. Metarock Laboratories, 3. Department of Earth and Atmospheric Sciences, University of Houston)
16:00-16:30	Break and Walk to Bizzell Museum	
16:30–17:30	Tour: History of Science Collections, Bizzell Memorial Library, The University of Oklahoma	
17:30–19:00	Networking Reception: Thurman J. White Forum Building	

Friday 29 March 2024		
Time	Presentation	Presenters*
7:30–8:20	Breakfast Buffet	
8:20–8:30	Welcome	Co-Chair: Ronny Hofmann
8:30-12:30	Session 6: Sustainable Energy Developments	
8:30-8:55	Methane Gas Hydrate Precipitation Modeling Using Digital Rock Physics	Daniel Rathmaier* ¹ , L. Zepa ¹ (1. Colorado School of Mines)
8:55-9:20	Evaluation of Hydrogen Interaction with Mudrocks: Implication for Geo-Storage	Sidi Mamoudou* ¹ , S. Dang ¹ , C. Rai ¹ (1. Mewbourne School of Petroleum and Geological Engineering, The University of Oklahoma)
9:20-9:45	Characterizing the Geomechanical and Geochemical Suitability of Saline Aquifers for Hydrogen Storage	Mohamed Sarhan* ¹ , L. Hathon ¹ , M. Myers ¹ (1. University of Houston)
9:45-10:00	BREAK	
10:00-10:25	Analysis of Seismic Anisotropy in Kevin Dome, Montana: A CCUS Project — From Core to Seismic	Alexandro Vera-Arroyo* ¹ , H. Bedle ¹ (1. The University of Oklahoma)
10:25-10:50	Rock Response to CO ₂ Fracturing and its Implication for Carbon Sequestration	Blessed C.A. Amoah* ¹ , C. Rai ¹ , M. Curtis ¹ , S. Dang ¹ (1. Mewbourne School of Petroleum and Geological Engineering, The University of Oklahoma)
10:50-11:10	The Effect of Anisotropy on scCO ₂ Transport in Shales: Implications to Carbon Geostorage	Felipe Cruz* ¹ , S. Dang ¹ , C. Rai ¹ (1. Mewbourne School of Petroleum and Geological Engineering, The University of Oklahoma)
11:15-12:00	Closing Remarks	