

Short Course Program

Advanced SCAL for Carbon Storage and EOR

MONDAY, October 9, 2023

Short Workshop: Advanced SCAL for Carbon Storage and EOR	
Moderator:	
8:30 – 8:50	Welcome and safety moment
8:50 – 9:40	Waiting for title Presenter: Shehadeh Masalmeh
9:40 – 10:30	Waiting for title Presenter: Mohammad Piri
10:30 – 10:50	Coffee Break Kindly Sponsored by: AMETEK Chandler Engineering
10:50 – 11:40	Supercritical CO ₂ and brine relative permeability, critical review and consistent analyses Presenter: Lisa Lun
11:40 – 12:30	Waiting for title Presenter: Sam Krevor
12:30 – 1:30	Lunch Kindly Sponsored by: Chevron

Technical Program

Monday, October 9, 2023

7:30 – 5:00 Registration Desk Open

1:30 – 3:15 **Session 1: SCAL for Carbon Storage & Utilization (1)**
Chairs:

SCA001 Measurement of Trapped Gas Saturation in Carbonate Rock:
Comparing 2-phase and 3-phase data to Support CCS and CO2 EOR
Projects

Shehadeh Masalmeh, Amir Farzaneh, Mehran Sohrabi, Ali Al-
Mesmari and Mohammad Al-Hammadi

SCA002 CO2-Brine Relative Permeability Measurements at Reservoir
Conditions: how to reconcile SS and USS methods?

Souhail Youssef

SCA003 A Review and Discussion on Laboratory Investigations Involving
Supercritical CO2 for Storage

Omidreza Mohammadzadeh Shanehsaz

3:15 - 3:30

Coffee Break

Kindly Sponsored by: AMETEK Chandler Engineering

3:30- 5:30 **Session 2: Improved SCAL Techniques and Interpretation 1**
Chairs:

SCA004 Stochastic Interpretation of CO2-Brine Primary Displacement in
Heterogeneous Carbonate Rocks

Omidreza Amrollahinasab

SCA005 Bulk saturation measurement of water and oil in porous media
using ¹³C and ¹H magnetic resonance

Benjamin Nicot

SCA006 Hybrid Drainage Technique application on bimodal limestone

Victor Fernandes

5:30 - 8:30

Opening Reception “Icebreaker Reception”

Tuesday, October 10, 2023

8:00 – 5:00 **Registration Desk Open**

8:30 - 10:00 **Session 3: Wettability**
Chairs:

SCA007 Impact of Dopants on SCAL Experiments, Phase I
Fabrice Pairoys

SCA008 Optimization of core restoration procedure based on adsorption of polar
crude oil components onto sandstone and carbonate rocks
Tina Puntervold

Exhibitor Presentations

10:00 - 10:30 **Coffee Break**
Kindly Sponsored by: Aramco America

10:30 – 12:00 **Session 4: SCAL for Carbon Storage & Utilization (2)**
Chairs:

SCA009 A Laboratory Investigation of Enhanced Gas Recovery by CO₂ Injection
Chris Jones

SCA010 CO₂/Brine Relative Permeability Estimation Using Effective Rock/Fluid
Properties: A Machine Learning-Based Approach
Fatemeh Reisi

SCA011 Laboratory Assessment of CO₂ Storage in Oil Reservoirs through
Converting Waterfloods to Carbonated Waterfloods
Mehran Sohrabi

12:00 - 1:00 **Lunch**
Kindly Sponsored by: TOTALEnergies

1:00 – 1:30 **Poster Session (SCA035-SCA044)**

1:30 - 2:30 **Coffee Break and Poster Session**
Kindly Sponsored by: Aramco America

2:30 – 3:00 **Exhibitor presentations**

3:00 – 4:30 **Session 5: Pore Scale Imaging and Modelling (1)**

Chairs:

SCA012 Derivation of a representative elementary volume (REV) for upscaled two-phase flow in porous media.
Carl Fredrik Berg

SCA013 Pore-scale comparisons of primary drainage techniques on non-water-wet reservoir rocks
Franck Nono

SCA014 A priori simulation of relative permeabilities of intact subsamples of tight oil shale from a hydraulic fracturing play
G. Peter Matthews

6:00 – 9:00 p.m. **Young Professional Event**

Wednesday, October 11, 2023

8:15 – 5:00 **Registration Desk Open**

8:30 – 10:00 **Session 6: SCAL for Carbon Storage & Utilization (3)**
Chairs:

SCA015 Steady-state supercritical CO₂ and brine relative permeability
measurements at different pressure conditions
Stacy Richardson

SCA016 SCAL model for CCS – Insights from the first commercial CO₂
project on the Norwegian Continental Shelf, the Northern
Lights
Einar Ebeltoft

SCA017 Risk of permeability impairment due to CO₂ hydrates
formation in sandstone: an experimental investigation using X-
Ray Radiography
Nicolas Gland

10:00 - 10:30 **Coffee Break**

10:30 – 12:00 **Session 7: Improved SCAL Techniques and Interpretation (2)**
- NMR
Chairs:

SCA018 Direct Hydrocarbon Saturation Imaging in Porous Media with
13C
Naser Ansaribaranghar

SCA019 Impact of Dual Matrix Porosity in Sandstone on Fluid
Distribution and Flow Properties
Yingxue Wang

SCA020 An integrated SCAL study for estimating wettability and relative
permeability
Raheleh Farokhpour

12:00 - 1:00 **Lunch**
Kindly Sponsored by: Stratum Reservoir

1:00 – 2:00

Session 8: Unconventionals and Source Rocks

Chairs:

SCA021

Laboratory Measurement of Total Porosity and Fluid Saturations for Unconventional Tight Rocks: Methodologies, Challenges, and Comparison

Min Cheng

SCA022

Delineating Light Hydrocarbon Configuration in Source Rocks from NMR Relaxation Mechanism of Nano-Confined Fluids

Jinhong Chen

2:00 – 2:30

Poster Presentations (SCA045-SCA054)

1:30 - 2:30

Coffee Break and Poster Session

2:30 – 4:30

Session 9: Displacement Mechanisms/EOR/IOR

Chairs:

SCA023

Foam-Assisted Enhanced Oil Recovery: Bridging the Gap between Theory and Practice

Lesley James

SCA024

Positive Capillary Forces: The Key for optimized Oil Recovery in Low-Permeable Cores

Md Ashraful Islam Khan

6:30 – 9:30

Gala Dinner

Thursday, October 12, 2023

8:30 – 3:00 **Registration Desk Open**

8:30 - 10:00 **Session 10: Pore Scale Imaging and Modelling (2)**

Chairs:

SCA025 Prediction of wetting condition in a reservoir rock using coupled digital rock and molecular dynamics simulation.
Ashraful Islam

SCA026 Prediction of relative permeability and fast wettability assessment using Digital Rock Physics: An operational study on a Reservoir Sandstone
Mohamed Regaieg

SCA027 Multiscale computational models for simulating relative permeability in complex carbonate rock sample
Guangyuan Sun

10:00 - 10:30 **Coffee Break**

10:30 – 12:00 **Session 11: Improved SCAL Techniques and Interpretation (3)**

- NMR

Chairs:

SCA028 Pore Size Measurement in Core Plugs with Magnetic Resonance based on Brownstein Tarr Relaxation Theory
Peiyua Yan

SCA029 Derivation of Waxman-Smiths and Indonesia parameters from Co-Cw experiments: a new perspective
Stefano Rossini

SCA030 The Effect of Different LET Parameters Combination in Relative Permeability towards Core and Field-Scale Simulations
Wilson Wiranda

12:00 – 12:30 **Business Meeting**

12:30 - 1:30 **Lunch**

1:30 – 2:00 **Poster Presentations (SCA055-SCA065)**

2:00 - 3:00 **Coffee Break and Poster Session**

3:00 – 5:00 **Session 12: Laboratory Core Analysis**
Chairs:

SCA031 Measurement of Gas Condensate Relative Permeabilities utilizing
NMR and MRI Technologies
Michael Rauschhuber

SCA032 Diffusion measurements with hydrogen and methane through
reservoir rock samples
Julia Michelsen

SCA033 Investigation of Temperature Characteristics of Secondary Organic
Matter and Hydrocarbons in the Early Jurassic Marrat Formation
using Laboratory NMR Techniques
Harry Xie

SCA034 The effect of sample anisotropy properties, dimensions, and
imposed no-flow boundaries on the measurement of directional
permeability and viscous resistivity
Jacob McGregor

5:00 **Closing Remarks**

Posters Presentations

Posters with Manuscript	
SCA042	Magnetic Core Analysis for Improved Interpretation of Potential Geothermal Prospects David Potter
SCA043	Application of Dielectric Measurements to Estimate Archie Parameters M and N from Drainage and Imbibition Data Salah Al-Ofi
SCA044	Gravity and flow velocity effects on fines migration in sandstone: A numerical approach in 3D with complete force set Christoph Arns
SCA045	X-Ray Computed Tomography 3D virtual plugging – value of the technique in challenging case studies. Alvaro Munoz-Beltran
SCA046	Complementary Models for Predicting the Formation Resistivity Factor and Resistivity Index at Overburden Conditions Meysam Nourani
SCA047	Resolving Challenges in Analyzing Iron-Rich Samples by X-Ray Diffraction Salah Al-Ofi
Posters without Manuscript	
SCA048	Quantitative use of dynamic 3D tomography for reservoir, CCS and environmental applications Nicola Bona
SCA049	A complex carbonate characterization by digital rock physics and NMR methods during centrifuge desaturation Jun Gao
SCA050	Centrifuge Data Correction for Complex Carbonate Rock Samples Ahmad M. AlZoukani
SCA051	Correlating the rheological properties of Pickering emulsions with the enhanced oil recovery efficiency in porous media Christos Tsakiroglou
SCA052	Characterization and Modeling of Hydroxyapatite Growth on Calcite Surfaces for Improved Oil Recovery Salem Alshammari

SCA053	Alkali Metal Cation Specific Effects at Calcite/Brine Interfaces for Wettability Alteration Salem Alshammari
SCA054	Machine learning and artificial intelligence algorithms for geomechanical rock properties prediction based on laboratory measurements and well logs Edyta Puskarczyk
SCA055	Dynamic elastic parameters of Jurassic deposits in the Marianowo Anticline (Poland) gas storage site with a CO ₂ cushion Krakowska-Madejska Paulina
SCA056	Integration of PCA and Clustering Analysis with Chemostratigraphy for Improved Lithofacies Characterization in Southwest Texas Liborius Andreina
SCA057	Study the effect of brine salinity concentration and confining pressure on both static and dynamic properties. Hussain Abdulhadi Jeshi
SCA058	Experimental characterization of the chemical reactivity of wet scCO ₂ in geothermal rocks under elevated temperature and pressure conditions Nicolas Rangel Jurado
SCA059	Comparing Two Different NMR Based Porosity Measurements of Drill Cuttings Michael Dick
SCA060	Pore Scale Modeling of Fracture Permeability Evolution Under Coupled Flow-Geochemical Process Xupeng He
SCA061	Synergy between Super-Resolution and Deep Learning: An Application on Thin Sections Xupeng He
SCA062	Residual Trapping during Sequestration of Supercritical CO ₂ in Carbonate Saline Aquifers: A Core-Scale Experimental Study Using In-Situ Saturation Measurement Technique Uche Igwe
SCA063	An Experimental Investigation of Three-phase Flow in a Carbonate Rock during Water-Alternating-Gas Injection Using In-Situ Saturation Measurement Technique Sheikh Faisal Kader Joy

SCA064	Digital Rocks Application to Refine Electrical Model of Microporous Carbonates Ivan Deshnenkov
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