Short Course Program

Digital Core Analysis: Pore-Scale Imaging, Modelling, and Deep Learning
August 26, 2024

Short Workshop: Digital Core Analysis: Pore-Scale Imaging, Modelling, and Deep Learning.	
Moderator: Ryan Armstrong	
8:30 – 8:40	Welcome and safety moment (Ryan Armstrong)
8:40 – 9:50 (10 min)	Course Introduction Presenter: Ryan Armstrong
8:50 – 9:40 (50 min)	Deep learning in pore-scale imaging and modelling Presenter: Masha Prodanovic
9:40 – 10:30 (50 min)	Deep learning in pore-scale imaging and modelling Presenter: Peyman Mostaghimi
10:30 – 10:50	Coffee Break **Kindly Sponsored by: AMETEK Chandler Engineering**
Moderator: Josephina Schembre-McCabe	
10:50 – 11:40 (50 min)	Industry 4.0 for Special Core Analysis: Overview, Research Trends, Opportunities, and Challenges. Presenter: Lesley James
11:40 – 12:30 (50 min)	Deep learning and Machine Learning for Core Analysis and Reservoir Characterization Presenter: Olivier Lopez
12:30 – 1:30	Lunch **Kindly Sponsored by:**

Technical Program

Monday, August 26, 2024	
7:30 – 5:00	Registration Desk Open
1:30 – 3:00	**Session 1: Big Data Deep Learning and Machine Learning for Core Analysis** **Chairs: Naif Alqahtani and XXX**
SCA1010	Tree-Based Machine Learning Can Determine Lithofacies Properties of Reservoir Rocks- Gamal Oil field Hamada et al.
SCA1036	Federated Learning Test for Collaborative Machine Learning Chang et al.
SCA1073	Permeability inference from 3D grayscale images using deep learning: how large-scale dataset can contribute to model generalization. Youssef et al.
3:00 - 3:30	**Coffee Break** **Kindly Sponsored by: AMETEK Chandler Engineering**
3:30- 5:00	**Session 2: Pore-Scale Imaging and Modelling I** **Chairs: Hyung Kwak and Souhail Youssef**
SCA1019	Modeling Surface Roughness Effect in Porous Media: From Pore to Core Scale Li et al.
SCA1030	Variation of wettability across different lithotypes in a reservoir and its impact on Digital Rock Physics pore scale simulations Faisal et al.
SCA1058	Stress Dependency of Permeability and Porosity Using Micromechanics Digital Rock

	Sun et al.
5:30 - 8:30	Opening Reception "Icebreaker Reception" Kindly Sponsored by: Chevron
Tuesday, August 27, 2024	
8:00 – 5:00	Registration Desk Open
8:30 - 9:30	Session 3: Core Analysis and Logging Interpretation Chairs: TBD and TBD
SCA1060	Pre-operational drilling fluid evaluation of oil- and water-based drilling muds considering the impact on core analysis. A case study from the Upper Jurassic in the Northern North Sea Schleifer et al.
SCA1021	Evaluation of Residual Oil in the Wara, Mauddud, and Burgan Formations, Burgan Field, Kuwait Jonathan et al.
9:30 – 10:00	Exhibitor Presentations
10:00 - 10:30	Coffee Break Kindly Sponsored by:
10:30 – 12:00	Session 4: MRI and NMR Chairs: Matthias Appel and Michael Dick
SCA1067	Fluid Quantification and Kerogen Assessment in Shales Using 13C and 1H Magnetic Resonance Measurements Zamiri et al.
SCA1024	Discrete Inversion NMR (DI-NMR): An NMR data processing method for Accurate Fluid Typing and Saturation Determination

	Gao et al.
SCA1035	Determination of clay-bound water in non-conventional oil reservoirs via T1 NMR measurements. A case study for the Vaca Muerta formation. Domené1 et al.
12:00 - 1:00	Lunch Kindly Sponsored by:
1:00 – 1:30	Poster Presentations (SCA10XX-SCA10XX)
1:30 - 2:30	Coffee Break and Poster Session (SCA10XX-SCA10XX) Kindly Sponsored by:
2:30 – 3:00	Exhibitor presentations
3:00 – 4:30	Session 5: Subsurface Storage Chairs: Stefano Pruno and Jon Burger
SCA01017	Measurement of CO2 Uptake Capacity in Source Rock Shales for GCS Chen et al.
SCA1057	Experimental determination of different saturation regions for underground geological CO2 storage Jenei et al.
SCA1022	Application of Analog Two-Phase Relative Permeability Data for Predicting the Full Cycle CO2/Brine Relative Permeability Curve Schembre-McCabe et al.
5:00 – 9:00 p.m.	Young Professional Event

	Kindly Sponsored by:
Wednesday, August 28, 2024	
8:15 – 5:00	Registration Desk Open
8:30 – 10:00	Session 6: Improved SCAL Techniques and Interpretation I Chairs: TBD and TBD
SCA1032	Relative Permeability Measurement Using Rapid In-Situ Saturation Measurement with MRI Zamiri et al.
SCA1077	Determination of Relative Permeabilities on Heterogeneous Samples Pairoys et al.
SCA1043	Investigation of Residual Oil Saturation at Different Capillary Number Regions through Surfactant-Polymer Flood Experiments Alabdumuhsen et al.
10:00 - 10:30	Coffee Break Kindly Sponsored by:
10:30 – 12:00	Session 7: Displacement Mechanisms EOR/IOR I Chairs: TBD and TBD
SCA1044	Investigating the Effect of Chemical Gradient in Polymer Flooding Alkandari et al.
SCA1031	Assessing the impact of dopants on electrokinetic rock properties as potential indicators for dopant induced wettability changes Halisch et al.
SCA1063	A Comprehensive Study on Nanoparticle-Surfactant Solutions for Foam-assisted Enhanced Oil Recovery: In-Depth Understanding via High Pressure Micromodel Visualization Experiments Machale et al.

12:00 - 1:00	Lunch Kindly Sponsored by:
1:00 – 2:00	Session 8: Improved SCAL Techniques and Interpretation II Chairs: TBD and TBD
SCA1011	A NOVEL APPROACH TO GAS CYCLING ENHANCED OIL RECOVERY (GCEOR) EVALUATION IN UNCONVENTIONAL POROUS MEDIA Thomas et al.
SCA1054	A Review of Primary Drainage Techniques Fernandes et al.
2:00 – 2:30	Poster Presentations (SCA10XX-SCA10XX)
2:30 - 3:30	Coffee Break and Poster Session (SCA10XX- SCA10XX) Kindly Sponsored by:
3:30 – 4:30	Session 9: Geothermal Chairs: TBD and TBD
SCA1014	A joint methodical case study for understanding severe formation clogging processes within a highly utilized geothermal reservoir in the Pannonian Basin of Hungary Njeru et al.
SCA1015	Thermal Conductivity: A Theoretically Simple, Yet Practically Challenging Experiment Gumpenberger et al.
6:30 – 9:30	Gala Dinner

	Kindly Sponsored by: iRock Technologies and Chevron
Thursday, August 29, 2024	
8:30 – 3:00	Registration Desk Open
8:30 - 10:00	Session 10: Displacement Mechanisms EOR/IOR II Chairs: Christopher Jones and Olga Vizika-Kavvadias
SCA1012	Foam Assisted Cyclic Solvent Injection in Heterogeneous Reservoirs Etemad et al.
SCA1028	An Experimental Investigation of Oil Recovery Mechanisms and Relative Permeability Curves obtained by Steady-State Versus Unsteady-State Displacement Alkhazmi et al.
SCA1042	Assessment of Magnetic Nanodroplets Propagation in Porous Media via Effluent Analysis Ahmadi et al.
10:00 - 10:30	Coffee Break Kindly Sponsored by:
10:30 – 12:00	Session 11: Pore-Scale Imaging and Modelling II Chairs: TBD and TBD
SCA1026	A Versatile Workflow of Pore Geometry-Structure Rock Typing and Corey's Parameter-Based Relative Permeability Trend Modeling Akbar et al.
SCA1029	IMPROVE ON DUAL-ENERGY PROTOCOL FOR ROCK CHARACTERIZATION AND MONITORING OF POROSITY AND PHASE SATURATIONS DURING MULTIPHASE FLOW Vargas et al.
SCA1056	Digital Rocks Portal for Image Curation, Characterization, Visualization and Transport Simulation

		Turhan et al.
12:00 – 12:30		Business Meeting
12:30 - 1:30		Lunch Kindly Sponsored by:
1:30 – 2:00		Poster Presentations (SCA10XX-SCA10XX)
2:00 - 3:00		Coffee Break and Poster Session (SCA10XX-SCA10XX) Kindly Sponsored by:
3:00 – 5:00		Session 12: Wettability Matthias Halisch and TBD
	SCA1027	The effect of wettability on the amount of adsorbed fluid and capillary condensation pressure in nanoporous materials Nguyen et al.
	SCA1046	Potential wettability alteration-IOR study for pre-salt carbonate from experiments to field scale simulation Karoussi et al.
	SCA1064	Characterizing Wettability Using 13C Magnetic Resonance Relaxation Times Ansaribaranghar et al.
	SCA1025	Pore scale investigation of dopant impact on wettability alteration Nono et al.
5:00		Closing Remarks

Alternate Orals

Alternation Orals	
SCA0000	TBD TBD
SCA0000	TBD TBD
SCA0000	TBD TBD
SCA0000	TBD TBD
SCA0000	TBD TBD

Posters Presentations

Posters with Manuscript	
SCA1039	PREDICTIVE MODELS FOR SUBSURFACE TEMPERATURE and IMPACT ON FORMATION RESISTIVITY FACTOR AND RESISTIVITY INDEX Askarinezhad et al.
SCA1041	Comparison of Fur and Lark diatomite potential for hydrocarbon production and CO2 storage Abdulina et al.
SCA1050	Mechanical Characterization of Unconventional Shales, Experimental Challenges and Solutions Jin et al.
SCA1062	Effect of Temperature on Pay Identification in Freshwater Environment-A Laboratory Study Al-Hamad et al.
SCA1065	13C MR Signal Density and Relaxation Times of Crude Oils Ansaribaranghar et al.
SCA1068	Detailed sensitivity analysis assessment for the determination of the best clay volume model in the shallow offshore area in Suriname Djodi et al.
SCA1069	The Importance of XRD data to overcome the challenges of Clay Volume Estimation in K-Felspar and Kaolinite-rich unconsolidated reservoirs of the Paleocene age in the Tambaredjo Oil Field of Suriname Idoe et al.
SCA1070	Rapid Predicted Profiles of Elemental Contents along Slabbed Cores from Probe Magnetic and Well Log Data Using a Machine Learning Approach Trained on XRF Data Okwoli et al.

SCA1072	A review on multi-resolution X-ray imaging methods for industrial and operational applications Alqahtani et al.
SCA1080	Characterization of Onshore Formations in Nova Scotia for CO2 Storage Basafa et al.
SCA1083	Fast measurements of capillary pressure using the porous plate method: An alternative to MICP Lenormand et al.
SCA1084	Physically based neural networks for solving heat and mass transfer problems in porous media Khasi et al.
SCA1089	Developing Correlations for Porosity and Permeability Between Mercury Intrusion and Gas Expansion Methods for Sandstone Core Plugs Abiashue et al.
Posters without Manuscript	
SCA1016	Spontaneous imbibition of oil exhibits heterogeneous nature of unconventional source rocks Althaus et al.
SCA1023	Assessment of carbonate reservoir rock core alteration by CO2 for carbon geological storage using micro-CT and nuclear magnetic Gao et al.
SCA1034	Integration of Helium Isothermal Adsorption Curve to Enhance Porosity Correlation in Unconventional Reservoir Samples: An Approach Inspired by Weibull Distribution Manuel et al.

SCA1037	An innovative workflow to measure total porosity and fluids saturation on preserved rock samples of source rock. Case study: Vaca Muerta Formation Masiero et al.
SCA1059	Overview of Heavy Oil in the Middle East: Past, Present and Future. Alajmi et al.
SCA1061	Enhancing Flow Ability in Underground Formation Using Environment-Friendly Acids Wang et al.
SCA1071	NMR T2 Interpretation and Diffusion Coupling in Dual-porosity systems: Impact of Diffusivity, Fluid Bulk Relaxation, and Wettability Gao et al.
SCA1075	How quantitative are T1-T2 maps? Dick et al.
SCA1076	The effect of SNR on T2 distributions and T1-T2 maps Dick et al.
SCA1078	Effect of carbonate dissolution of the rock initial properties Mascle et al.
SCA1079	Measuring CO_2 and H_2 gas entry pressure into shale caprock: Applications to hydrogen storage and CCS Anger et al.
SCA1085	Noise detection of digital rock imaging data based on computer vison and deep learning methods Khasi et al.
SCA1090	Characterization of basalt alteration and its impact on carbon storage Kelly et al.