# EAGE
**EUROPEAN ASSOCIATION OF GEOSCIENTISTS & ENGINEERS**

**10th ANNIVERSARY**

# Innovative Technology for Reservoir Optimization

**FIFTH EAGE WELL INJECTIVITY & PRODUCTIVITY IN CARBONATES (WIPIC) WORKSHOP**

**13-16 APRIL 2025 • DOHA, QATAR**

- **Final Announcement**

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مجلس قطر للبحوث والتطوير والابتكار
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## OVERVIEW

This fifth edition of our workshop on Well Injectivity and Productivity in Carbonates (WIPIC) is a follow-up to the very successful workshop held in March 2022 in Doha, Qatar. This year's theme is Innovative Technology for Reservoir Optimization. Building on the feedback and success from previous events, the workshop scope continues to cover the entire reservoir, not just the wells.

For optimal field development, injectivity and productivity of wells are essential, especially in heterogeneous reservoirs such as carbonates. However, incorporating other elements — such as geological modelling, reservoir simulation, reservoir management, history matching, uncertainty assessment,

and enhanced recovery mechanisms — is crucial as we move towards a multidisciplinary approach to problem-solving. This year, we are excited to introduce new topics : digitalization, machine learning, and artificial intelligence. These cutting-edge technologies promise to revolutionize our approach to reservoir management by enhancing data analytics, predictive modeling, and decision-making processes.

With representatives from national oil companies, international oil companies, service providers, universities, and research institutes, this workshop is designed to appeal to subsurface specialists in well stimulation and completion, log analysis, petrophysics, pressure transient analysis, reservoir geology and geophysics, applied mathematics, data science, geo-statistics, and reservoir engineering. It will also be valuable for subsurface generalists and reservoir managers.

## TOPICS

- Enhanced/ Improved recovery mechanisms
  - Water, gas, WAG, and chemical flooding
- Use of data analytics, machine learning and other artificial intelligence applications for optimizing oil and gas field development and reservoir management
  - History matching and forecasting
- Drilling operations and completion / well intervention technologies
  - Well injectivity, productivity and stimulation, in-flow control / conformance control
  - Artificial lift
- Reservoir management strategies
- In-well data acquisition and reservoir / seismic monitoring
- Produced water management
- Reservoir characterization
- Reservoir simulation
  - Geomodelling
  - Geomechanics
- Enhanced core analysis and digital rock physics
- Emerging reservoir management applications
  - H2 and CO2 storage
  - Geothermal

## WORKSHOP COURSES

### Reservoir Simulation Fundamentals
**Instructed by Dr. Leonardo Patacchini (Stone Ridge Technology)**

About the Instructor

Leonardo Patacchini, joined as the Regional Director (Europe and Middle East) of SRT in February 2019 after a decade with TOTAL as a Reservoir Engineer based in France, the United Arab Emirates and Scotland. Leonardo has an Engineering degree in Physics from Ecole Polytechnique (France) and a PhD in Applied Plasma Physics from MIT.

Short Course Overview

The aim of this course is to review a wide selection of reservoir simulation concepts needed to build and run a dynamic model. Topics of discussion include introduction to reservoir simulation and the underlying mathematics, grids, aquifers, PVT data, rock and fluid data, initial conditions, time dependent data, and troubleshooting. Given the one-day course format, the material will be covered at an overview level with opportunities to delve deeper into topics when questions are asked.

### Introduction to Machine learning applied for reservoir characterization
**Instructed by Dr. Ahmad Abushaikha (Hamad Bin Khalifa University)**

About the instructor

Dr. Ahmad Sami Abushaikha is a founding faculty member. He received his BS in Petroleum Engineering and his BA in Economics from the University of Texas at Austin in 2004. In 2006, he received his MS in Reservoir Geosciences and Engineering from "Institut Français du Pétrole". From 2007 to 2009, he worked at TOTAL Research Centre at Pau, France and at Qatar Petroleum. In 2013, he received his PhD in Petroleum Engineering from Imperial College London. From 2015 to 2017, he was a Postdoctoral Research Fellow at Stanford University specializing in discretization schemes for fluid flow in porous media.

Short Course Overview

"Introduction to Machine Learning Applied for Reservoir Characterization" is a course designed to provide attendees with a foundational understanding of machine learning techniques and their applications in the oil and gas industry, specifically for reservoir characterization. The course covers key machine learning concepts, including supervised and unsupervised learning, data pre-processing, and model validation, while focusing on their implementation in subsurface modeling. Attendees will explore how machine learning can be used to predict reservoir properties, enhance data interpretation, and optimize field development strategies, with practical examples and case studies relevant to the energy sector.

## EAGE COURSE

### Upscaling and Artificial Intelligence Based Proxies for Uncertainty Assessment of Reservoir Production
**Instructed by Prof. Dr. Dominique Guérillot (Terra 3E)**

About the instructor

Dr. Dominique Guérillot has been appointed as a professor in the Petroleum Engineering Program at Texas A&M University. He previously served on the executive committee of the Institut Français du Pétrole (2001–2006) and was head of reservoir research at Qatar Petroleum (2013–2015). Currently, he is the President and CEO of Terra 3E SAS, an innovative company. Dr. Guérillot has authored over 50 peer-reviewed papers and holds five patents. He earned his Ph.D. in applied mathematics from Aix-Provence Université, France.

Short Course Overview

The aim of the course is to recap main techniques required to build an integrated reservoir model and to explain different potential workflows for field development and/or history matching processes. This course will include explanations of upscaling techniques and the use of proxies for uncertainty assessment of production forecasts. You can find more information about this course through the EAGE short course catalogue link here.

## OPENING ADDRESS SPEAKER

**Abdulrahman Husni Abu-Nada**
Senior Research Programs Specialist
Qatar Research Development and Innovation
Council (QRDIC)

## KEYNOTE SPEAKERS

**Dr. Ra'ed Kawar**
Senior Advisor
QatarEnergy
*Keynote Title: Harnessing AI & Digital Innovation to Unlock Subsurface Potential*

**Haytham Abdulaziz Al Meer**
Chief Subsurface Officer
QatarEnergy LNG
*Keynote Title: From Data to Value: The Digital Evolution of Reservoir Management*

**Christophe Soyeur**
VP GSR & Asset Operated by Other (Oil)
TotalEnergies
*Keynote Title: Digital Transformation in Geosciences: Practical Applications and Insights*

**Guillaume Dupuis**
EOR-IOR Business Development Manager
SNF
*Keynote Title: Maximizing Recovery in Carbonate Reservoirs: The Evolution and Future of Sustainable Polymer-Based EOR Technologies*

## PANEL DISCUSSIONS

### Panel 1: AI and ML in Reservoir Optimization
14 April 2025 | 9:40 AM - 10:50 AM

Moderator

**Ahmad Abushaikha**
Associate Professor
Hamad Bin Khalifa University

Panelist

**Dr. Vincent Natoli**
Founder/ CEO
Stone Ridge Technology

**Mansour Belhadj**
General Manager Driving Energy Industry
Growth
Microsoft

**Dr. Ra'ed Kawar**
Senior Advisor
QatarEnergy

**Dany Rahal**
VP Digital MENA
SLB

### Panel 2:  Reservoir Management
15 April 2025 | 2:10 PM - 3:10 PM

Moderator

**Muhammad Ibrahim**
Advisor – Field Development Planning
SLB

Panelists

**Ahmed Al Emadi**
Manager - Operated Offshore Oil Field
Development
QatarEnergy

**Mohammed Ali Al-Buainain**
Petroleum Engineering Manager
QatarEnergy LNG

**Christophe Soyeur**
VP GSR & Asset Operated by Other - Oil
TotalEnergies

## TECHNICAL PROGRAMME

### Short Courses | Sunday 13 April

| AL SANBOOK 1 | | AL SANBOOK 2 | | AL QAREB 2 | |
|---|---|---|---|---|---|
| **Reservoir Simulation Fundamentals**<br>Leonardo Patacchini (SRT) | | **Introduction to Machine learning applied for reservoir characterization**<br>Dr. Ahmad Abushaikha (HBKU) | | **Upscaling and Artificial Intelligence Based Proxies for Uncertainty Assessment of Reservoir Production**<br>Prof. Dr. Dominique Guérillot (Terra 3E) | |
| 08:00 | Registration & Welcome Coffee | | | | |
| 08:55 | HSSE From Hotel | | | | |
| **Session 1** | | | | | |
| 09:00 | Numerics and gridding | 09:00 | Fundamental of Machine Learning and Applications in Reservoirs | 09:00 | Reservoir Characterization & Stimulation |
| 10:30 | Morning Coffee Break | | | | |
| **Session 2** | | | | | |
| 11:00 | Physical models | 11:00 | Pre-Processing and Feature Engineering | 11:00 | Kriging and Geostatistical Simulations |
| 12:00 | Lunch Break - Al Liwan Restaurant | | | | |
| **Session 3** | | | | | |
| 13:30 | Advancing the simulator through time | 13:30 | Model Development, Evaluation, and Case Studies | 13:30 | Upscaling and Uncertainty in Production Forecast |
| 15:00 | End of Short Course | | | | |
| 19:00 | Icebreaker Reception | | | | |

### Oral Presentations | Monday 14 April

| AL DASHA BALLROOM | |
|---|---|
| 08:00 | Registration & Welcome Coffee |
| 08:30 | HSSE From Hotel |
| 08:35 | Welcome by Co-Chairs Ahmad Abushaikha (HBKU) & Herbert Lescanne (TotalEnergies) |
| 08:45 | Opening Address by Dr. Abdulrahman H. Abu-Nada (QRDI) |
| 09:10 | **Keynote 1 - Harnessing AI & Digital Innovation to Unlock Subsurface Potential -** Dr Ra'ed Kawar (Qatar Energy) |

**Panel 1 - AI and ML in Reservoir Optimization**
Moderator: Ahmad Abushaikha

| 09:40 | Introduction to Panelists & Discussion<br><br>**Panelists**<br>Dr. Vincent Natoli (Stone Ridge Technology)<br>Mansour Belhadj (Microsoft)<br>Dr. Ra'ed Kawar (QatarEnergy)<br>Dany Rahal (SLB) |
|---|---|
| 09:50 | **Panel Topics**<br>1. AI/ML Applications in Oil and Gas<br>2. Impact and Value Creation<br>3. Human Capital and Digital Transformation<br>4. Challenges and Next Steps |
| 10:40 | Audience Q&A |
| 10:50 | Morning Coffee Break & 10th Anniversary Celebration (Cake Cutting & Photo) |

**SESSION 1 - Use of data analytics, machine learning and other artificial intelligence applications for optimizing oil and gas field development and reservoir management**
Session Chairs: Martin Blunt (Imperial College London), Muhammad Ibrahim (SLB)

| 11:20 | **Keynote 2 - Digital Transformation in Geosciences: Practical Applications and Insights - Christophe Soyeur (TotalEnergies)** |
|---|---|
| 11:50 | **Advancing data management and innovation in the energy industry - Shell Journey -** I. Khan (Shell) |

| 12:10 | **Full-field Proxy Development Using Neural Operator-based Machine Learning Approach for Reservoir Simulation -** K. Mukundakrishnan[1]*, S. Ranjan[1], K. Wiegand[1], D. Tishechkin[2], D. Kahn[2], V. Ananthan[2]<br>[1] Stone Ridge Technology; [2] Amazon Web Services |
|---|---|
| 12:30 | Lunch Break - Al Liwan Restaurant |
| 13:30 | **Waterflooding optimization using ANN proxies and Mean-Standard deviation objective function with a Sharpe ratio -** D. Guérillot<br>Terra 3E SAS |
| 13:50 | **End-to-End GANs and TimeGPT for Multidimensional Reservoir Characterization -** A.A. Al-Fakih[1]*, A. KOESHIDAYATULLAH[1], S. Kaka[1]<br>[1] King Fahd University of Petroleum Minerals |
| 14:10 | **Machine Learning-Based Prediction of Throat Clogging by Fine Migration in Porous Media -** A. Elrahmani[1]*, R. Al-Raoush[1]<br>[1] Department of Civil and Environmental Engineering, Qatar University |

**Poster Session 1: Lightning Session**

| 14:30 | **Lightning Session - Presenters introducing their posters** |
|---|---|
| | **Investigation of Reinforced machine Learning for History Matching -** K. Mohammadi[1]*, A. Abushaikha[1], J. Schneider[1]<br>[1] Hamad Bin Khalifa University |
| | **Gradient-based Optimization Techniques for Automatic History Matching in Reservoirs -** H. Shakir[1]*, A. Abushaikha[1]<br>[1] Hamad Bin Khalifa University |
| | **Leveraging Dashboards for the History Match of Giant Carbonate Field -** O. Fraute[1]*, F. Clement[1], M.S. Fakhroo[2], A.O. Fadipe[2]<br>[1] TotalEnergies; [2] QatarEnergy |
| | **Multiphase Production Logging in Long Horizontal Well to Optimise Multizone Production in a Complex Carbonate Reservoir -** S. Sen[1]*, A. Abouganem Stephens[2], B. Marir[1], R. Marizal[1], M. Laurie[1], C. Pointer[3], C. Perrin[1], F. Nurrachman[1], C. Boekhorst[1], F. Rehman[3], M. Podoplelov[3], A. Memon[1]<br>[1] NOC; [2] SLB; [3] TotalEnergies |
| | **AutoSum for a generic CO2 Storage project -** K.M. Leong[1]*, J. Limbeck[2], A. Ananad[3]<br>[1] Qatar Shell GTL Limited; [2] Shell Information Technology International B.V.; [3] Shell Global Solutions International B.V. |

## Oral Presentations | Monday 14 April

### Poster Session 1: Lightning Session

| 14:30 | **Temporal Extrapolation and Reliable Generalization via Temporal Neural Operator (TNO) for Geologic Carbon Storage -** W. Diab[1]*, M. Al Kobaisi[1]<br>[1] Khalifa University of Science & Technology |
|---|---|
| | **Machine Learning in Well Placement Optimization: A Comprehensive Review -** A. Eltayeb[1]*, A. Abushaikha[1], O. Massarweh[2]<br>[1] Hamad Bin Khalifa University |
| | **Using ML-Supervised Learnings Based-Algorithms to Create a Relative Permeability Model -** A. Aggarwal[1]*, S. Kumar[1], S.K. Subbiah[1], P. Bajpai[1]<br>[1] SLB |
| | **Formulating Smart Proxy Models for a Mature Asset's Production Forecasting Under Uncertainty -** O. Akuanyionwu[1]*, K. Aissaoui<br>[1] QatarEnergy |
| | **Use of Water Injector as Gas Shield for Reservoir Management -** A. SUKAPRADJA[1]*, B. MARIR[1], A. O'CONNELL[1], P. HUTSON[1], R. BRAHMANTIO[1]<br>[1] North Oil Company |
| 14:45 | **Afternoon Coffee Break & Poster Presenters engage with delagates about their posters** |

### SESSION 2 - Enhanced / Improved recovery mechanisms
Session Chairs: Henri Bertin (Université de Bordeaux), Leonardo Patacchini (SRT)

| 15:15 | **Keynote 3 - Maximizing Recovery in Carbonate Reservoirs: The Evolution and Future of Sustainable Polymer-Based EOR Technologies, Guillaume Dupuis (SNF)** |
|---|---|
| 15:45 | **Offshore Oil Field Holistic WAG Injection Review -** R. Bertrand QatarEnergy |
| 16:05 | **Evaluating Liquid Polymers for EOR: Injectivity Challenges in Low Permeability Reservoirs -** E. Ghodsi[1], M. Tahir[2]*, R.E. Hincapie[2], D. Steineder[2], T. Clemens[2], A. Farzaneh[2], D. Marx[2], N. Baric[2], R. Kharrat[1]<br>[1] Montanuniversität Leoben; [2] OMV Exploration & Production GmbH |
| 16:25 | **Effects of solubility modeling on fluid flow in natural gas fields with presence of aquifers -** A.S. Abd[1]*, A. Abushaikha<br>[1] Hamad Bin Khalifa University |
| 16:45 | **Closing Remarks by Co-Chairs** |
| 16:50 | **End of Day 2** |

## Oral Presentations | Tuesday 15 April

### AL DASHA BALLROOM

| 08:00 | **Registration & Welcome Coffee** |
|---|---|
| 08:30 | **Opening Remarks by Co-Chairs Ahmad Abushaikha (HBKU) & Herbert Lescanne (TotalEnergies)** |

### SESSION 3 - Reservoir characterization
Session Chairs: Sharon Finaly (North Oil Company), Ahmad Abushaikha (HBKU)

| 08:40 | **Keynote 4 - Innovative Strategies for Reservoir Optimization in Carbonate Reservoirs, Mathieu Rae (Shell)** |
|---|---|
| 09:10 | **Depth Surface Generation Workflow For A stack Carbonate Reservoir -** G. Berthereau[1]*<br>[1] NOC |
| 09:30 | **Panoptic segmentation for microcrystalline calcite in SEM petrographic images for carbonate reservoir characterization -** M. Ishaq[1], M. Yaqoob[1], I.S.A.J. Jayachandran[1], T. D. Seers[1]*<br>[1] Texas A&M University |
| 09:50 | **Carbonate Total Pore System Integration Across Characterization, Modelling, Surveillance and Reservoir Management -** V. Nzerem[1]*, S. Fullmer[1], J. Kolvoord[1], H. Alqassab[1]<br>[1] Exxonmobil Technology & Engineering Company (EMTEC) |
| 10:10 | **Breakthrough in Reservoir Characterization and Well Conformance Using Multi-Physics and Multi-Dimensional Measurements -** R. Al Lawati[1]*, A. Mukherjee[1], A. Donald[1], M. Ibrahim[1], A. Embaireeg[1], K. Suzuki[1], V. Kramar, C. Jyoti Keot[1], F. Ben Amor[1], P. Shukla[1], A. Singh Bisain[1], A. Morad[1], M. Viandante[1], R. Bedoya[1], M. Nassar[1], M. Nashaat<br>[1] slb |
| 10:30 | **Morning Coffee Break** |

### SESSION 4 - Reservoir simulation
Session Chairs: Massimiliano Ferronato (University of Padua), Clement Fabbri (TotalEnergies)

| 11:00 | **Six stage Integrated subsurface modelling of a complex fractured reservoir in Offshore oilfield -** A. Mukherjee[1]*, C. Darous[1], K. Ghorayeb[1], F. Ben Amor[1], E. Lenskaya[1], S. Subbiah[1], M. Ibrahim[1]<br>[1] Schlumberger |
|---|---|
| 11:20 | **Application of Nonlinear Probability Models to Mature Infill Risk Assessments and Opportunity Screening -** O. Akuanyionwu[1]<br>QatarEnergy |
| 11:40 | **EoS-based equilibrium model for simulation of geological carbon sequestration -** A. Ferrari[1]*, P. Panfili[1], G. Rivolta[1], L. Patacchini[2], K. Esler[2], A. Cominelli[1]<br>[1] Eni; [2] Stone Ridge Technology |
| 12:00 | **A Sparsified Multiscale Preconditioner for Fractured Porous Media -** O. Chaabi[1]*, M. Al Kobaisi[1]<br>[1] Khalifa University of Science & Technology |
| 12:20 | **QASR Reservoir Simulator: From Research Proposal to the Road of Commercialization -** A.S. Abushaikha[1]*, A. Abd[1]<br>[1] Hamad bin Khalifa University |
| 12:40 | **Lunch Break - Al Liwan Restaurant** |
| 13:40 | **Keynote 5 - From Data to Value: The Digital Evolution of Reservoir Management, Haytham Abdulaziz Al Meer (QatarEnergy LNG)** |

### Panel 2 - Reservoir Management
Moderator: Muhammad Ibrahim (SLB)

| 14:10 | **Introduction to Panelists & Discussion**<br><br>**Panelists**<br>Ahmed Al Emadi (QatarEnergy)<br>Mohammed Ali Al-Buainain (QatarEnergy LNG)<br>Christophe Soyeur (TotalEnergies) |
|---|---|
| 14:20 | **Panel Topics**<br>1. Process<br>2. People<br>3. Technology<br>4. Innovation |
| 15:00 | **Audience Q&A** |

## Poster Session 2: Lighting Session

| | |
|---|---|
| 15:10 | **Applying Controlled Mud Level to Open Hole Gravel Pack -** S. Lutnes<br>Enhanced Drilling |
| | **Workflow and procedures to create Pore Pressure Prediction Model for Deep Drilling Wells -** A. Sabry[1]*, M. Abdullah<br>[1] Kuwait Oil Company |
| | **Improved Geothermal Drilling Solutions Utilizing Nanomaterials and Graphene Oxide as Additives to Overcome HPHT Challenges -** M. Bouhssas[1]*, J. James Abraham[1]*, M. Amani[1]<br>[1] Texas A&M University at Qatar |
| | **FSAI preconditioner for reservoir simulations -** A. Mavliutov[1]*, A. Franceschini[1], C. Janna[1,2]<br>[1] University of Padova; [2] M3E S.r.l |
| | **Enhanced Reservoir Management by Optimizing Multilateral Drilling and Sidetrack Planning, leveraging 1D-3D Reservoir Mapping technologies -** C.J. Keot[1]*, A. Morad[1], V. Kramar[1], J. Naumann[1], A.S. Bisain[1], M. Viandante[1], R. Bedoya[1], F. Ben Amor[1], S. Dasgupta[1], A. Mukhrejee[1]<br>[1] SLB |
| | **Advanced Geological Characterization of Karst Morphologies Utilizing Integrated Drilling and 3D Seismic In Production Optimization Strategies -** G. Gangatharan[1], M.A. Al-Jaber[1]*, R. Hussain[1]<br>[1] NOC |
| | **Pipe Diagnostic Using Innovative Water Flow Log Techniques -** F. Al-Mutawa[1]*, K. Gzara[1]<br>[1] QatarEnergy LNG |
| | **Geostatistical modeling and optimization of subsurface reservoir properties: A permeability estimation example -** S. Aloui[1]*, A.S. Abushaikha[1], A. Elomri[1]<br>[1] Hamad Bin Khalifa University |
| | **Prediction of Reservoir Permeability and Porosity using a Deep Learning Technique -** M. Moussa[1]*, A. Abuskaikha[1]<br>[1] Hamad Bin Khalifa University |
| | **Efficiency and Accuracy of Linearization Methods for Multi-Phase Flow in Porous Media -** A. Asif[1]*, A.S. Abd[1], A. Abushaikha[1]<br>[1] Hamad Bin Khalifa University |
| 15:25 | **Afternoon Coffee Break & Poster Presenters engage with delagates about their posters** |

## SESSION 5 - Reservoir management strategies
Session Chairs: Muhammad Ibrahim (SLB), Herbert Lescanne (TotalEnergies)

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|---|---|
| 15:55 | **Brownfield Opportunities Identification Using an Integrated Approach -** K. Aissaoui[1]<br>[1] QatarEnergy |
| 16:15 | **Value of deep injection & utilization of multizone completion in solving nonconformance problem in fractured carbonate reservoir -** H. MAKHLOUF[1]*, G. JAYANTO[1], A.L. MEMON[1], F. Ur REHMAN[1], R. SENOPUTRA[1], R. SHARDA[1], P. KUMAR[1], C. Chike ODUKWE[1]<br>[1] North Oil Company |
| 16:35 | **Vision Transformers based Pore Type Classification for Carbonate Reservoir Characterization -** Y. Qaiser[1]*, I. Ansari[2], Y. Ansari[2], M.Y. Ansari[1], I. Sujay[3], T. Khan[4], H. Rabbani[5], J.C. Laya[3], T. Seers[4]<br>[1] Texas A&M University; [2] HBKU |
| 16:55 | **Reduced-order modeling framework for water injection optimization and efficient reservoir management -** A.P. Singh[1]*, B. Wang[1], K. Kostro[1]<br>[1] TotalEnergies |
| 17:15 | **Closing Remarks by Co-Chairs** |
| 17:20 | **End of Day 3** |
| 19:00 | **Dinner Evening at SMAT Restaurant** |

## Oral Presentations | Wednesday 16 April

### AL DASHA BALLROOM

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|---|---|
| 08:00 | Registration & Welcome Coffee |
| 08:30 | Opening Remarks by Co-Chairs Ahmad Abushaikha (HBKU) & Herbert Lescanne (TotalEnergies) |

### SESSION 6 - Geo-mechanics
Session Chairs: Herbert Lescanne (TotalEnergies), Ibnelwaleed Ali Hussein (Qatar University)

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|---|---|
| 08:40 | **Role of Rock Fabric in Mechanical Failures at Reservoir: Laboratory Test Results and its Engineering Implications -** M.E. Sanchez Ho[1]*, R.R. Kumar[2], S.K. Subbiah[2] [1] QatarEnergy; [2] SLB |
| 09:00 | **Thermal Induced Fractures in Moho : Field management & well analysis -** C. Castano Uribe[1]*, Y. Schildberg[1], J. Ochi[1], T. Dieuzeide[1] [1] TotalEnergies |
| 09:20 | **GReS: A novel multi-physics multi-domain computational tool for geomechanical simulations -** M. Ferronato[1]*, A. Franceschini[1], D. Moretto[1] [1] University of Padova |
| 09:40 | **GEOS: A Multi-Physics Simulation Framework for Subsurface Applications -** N. Castelletto[1]* [1] Lawrence Livermore National Laboratory |
| 10:00 | **Coupling flow and geomechanics to model fault reactivation in CO2 storage operations -** S. Nardean[1], A. Ferrari[1]*, S. Monaco[1], S. Mantica[1], A. Cominelli[1] [1] Eni S.p.A. |

### Poster Session 3: Lighting Session

| | |
|---|---|
| 10:20 | **Limestone Dissolution in CO2-Rich Environments for Carbon Sequestration in Carbonate Reservoirs -** O. Massarweh[1]*, M. Alherbawi[1], T. Al-Ansari[1], A. Abushaikha[1] [1] Hamad Bin Khalifa University |
| | **Reconstruction of 2D Images from 3D micro-CT Rock Images for Numerical Simulations and Reservoir-on-a-Chip Applications -** A. Tariq[2], S. Pavuluri[2], H. Rabbani[1]* [1] Hamad Bin Khalifa University; [2] Texas A&M University at Qatar |
| | **Coupling Geomechanics with Flow Models Using Advanced Hybrid Discretization for Carbon Sequestration Simulation -** C.H. Liu[1]*, A. Abushaikha[1] [1] Hamad Bin Khalifa university |
| | **Multidisciplinary approach for successful stress measurements and mapping completion quality -** M.E. Sanchez Ho[1]*, R.R. Kumar[2], S.K. Subbiah[2] [1] QatarEnergy; [2] SLB |
| | **SCAL, saturation modeling and model initialization in complex carbonate reservoirs with paleo-conditions and wettability dependent saturation -** A.R. Shah[1], K. Ghorayeb[1], C. Darous[1], H. Monfared*, M. Nashaat[1] [1] SLB |
| | **Innovative Preformed Particle Gels for Effective Water Control in Oil and Gas Reservoirs -** A. Hamza[1], A. Ben Ali[1], R. Elaf[1], A. Almakimi[2], M. Saad[1], I. Hussein[1]*, B. Bai[2] [1] Qatar University; [2] Missouri University of Science and Technology |
| | **Experimental Investigation of Pore-scale Processes in Surfactant Flooding in Heterogeneous Carbonate Reservoirs -** H.M. Alzahrani[1]*, B. Bijeljic[1], M.J. Blunt[1] [1] Imperial College London |

### Poster Session 3: Lighting Session

| | |
|---|---|
| 10:20 | **A New Numerical Method to Investigate Capillary End Effects in Coreflooding -** X. Bu[1]*, A. Moataz[2] [1] Beijing Research Center, Aramco Asia; [2] EXPEC ARC, Saudi Aramco |
| | **Use of Multi-Zones Smart Completions for Reservoir Management in an Extremely Complex Carbonate Reservoir Offshore Qatar -** M.N. Abu Talib[1]*, N. Abdelsamea[1], B. Marir[1], A.L. Memon[1], A.P. Djumriadi, R. Brahmantio [1] North Oil Company |
| | **An Integrated Case Study on Utilizing Digital Initiatives on Permanent Downhole Gauge Pressure Fixing Campaigns -** A. Al-Subaie[1]* [1] QatarEnergy |
| 10:35 | **Morning Coffee Break & Poster Presenters engage with delagates about their posters** |

### SESSION 7 - Enhanced core analysis and digital rock physics
Session Chairs: Dominique Guérillot (Terra 3E), Moataz Abu-Al-Saud (Aramco)

| | |
|---|---|
| 11:05 | **Digital Rocks in the Energy Transition -** M. Blunt[1]* [1] Imperial College |
| 11:25 | **Improving Core Value by Implementing a Combination of Improved and Innovative Coring Methods -** S. Finlay[1]*, K. Baggley[1], R. Slootweg[1], M. Faraz Khan[1], D. Cross[1], P. Lazic[1], S. El-Beshbishy[2], A. Thompson[3] [1] North Oil Company; [2] Reservoir Group; [3] Specialised Oil Services |
| 11:45 | **U-Net-based Semantic Edge Detection for Carbonate Reservoir Characterization -** M. Yaqoob[1]*, M. Ishaq[1], T. D. Seers[1] [1] Texas A&M University |
| 12:05 | **Synchrotron microtomography of vugs and microfractures formation within sediments due to fines migration via multiphase flow -** J. Hannun[1]*, R. Al-Raoush[1] [1] Qatar University |
| 12:25 | Lunch Break - Al Liwan Restaurant |

### SESSION 8 - Emerging reservoir management applications
Session Chairs: Herbert Lescanne (TotalEnergies), Kong Mun Leong (Shell)

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| 13:25 | **Assessment of Acoustic Reservoir Pressure Measurements at the Well-Head -** A. Mohsin[1]*, K. Palop[2], S. Al-Emadi[1] [1] Dolphin Energy Ltd.; [2] Scanwell Oil & Gas Services |
| 13:45 | **OBN hybrid concept and 4D used in carbonates Middle East environment -** F. Achilli[1]*, Y. Ellabad[3], O. Lamerain[2], Z. Yu[4], L. Junchao[4] [1] Noc / Totalenergies; [2] TotalEnergies; [3] NOC; [4] BGP Offshore |
| 14:05 | **Simulation of geologic carbon sequestration in faulted poroelastic media -** M. Cusini[1]*, M. Frigo[2], N. Castelletto[1], R. Settgast[1] [1] Lawrence Livermore National Laboratory; [2] Stanford University |
| 14:25 | **Integration of time-lapse saturation logging and 4D seismic to successfully monitor waterflood performance in Chalk reservoir -** S. Datta[1]*, A. Singh[1], N.B. Frandsen[1], K. Kostro[1] [1] Total Energies |
| 14:45 | **Use of 4D Seismic in Reservoir Management -** R. Brahmantio[1]*, A. Urakov[1], F. Aljanahi[1], G. Berthereau[1], A. O'Connell[1], B. Marir[1] [1] North Oil Company |
| 15:05 | Afternoon Coffee Break |

## Oral Presentations | Wednesday 16 April

| | **SESSION 9 - Drilling Operations and Completion / Well intervention Technologies** Session Chairs: Mahmood Amani (Texas A&M University at Qatar), Adel Mohsin (Dolphin Energy) |
|---|---|
| 15:35 | **Ultrasonic Cement Evaluation in Corrosion Resistant Alloy Casing -** R. Mulyanto[1]*, A. Stephens[2]<br>[1] QatarEnergy LNG; [2] slb |
| 15:55 | **Evaluating Khuff Formation Time Dependency Utilizing LWD High-Resolution Ultrasonic Imager -** S. Al Sawafi[1]*<br>[1] Halliburton; [2] Shell Developemnt Oman |
| 16:15 | **Utilizing Clay Minerals for Efficient Treatment of Oilfield Wastewater -** A. Hamza[1], A. Ben Ali[1], R. Elaf[1], S. Saeed[2], I. Hussein[1]*, M. Nasser[1], M. Hassan[3], M. Gamal El-Din[4]<br>[1] ExxonMobil Research Qatar; [2] Qatar University [3] University of Alberta |
| 16:35 | **Optimizing fracture control in thin multilayer carbonate reservoirs with Surgifrac stimulation -** M. Elwahsh[1]*, G. Ibrahiim[1], B. Pignot[1], C. Virdarie[2], A. Alyafei[2], T. Hamza[3]<br>[1] TotalEnergies; [2] QatarEnergy; [3] Halliburton |
| 16:55 | **ACOUSTIC OIL-WATER-FINES SEPARATION FOR SUSTAINABLE OIL PRODUCTION OPERATION -** A. Abdel-Fattah[1]*, M. Alsoraya[1], A. Alghiryafi[1]<br>[1] EXPEC Advanced Research Center, Saudi Aramco |
| 17:15 | **Closing Remarks by Co-Chairs** |
| 17:35 | **Close of Workshop** |

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## VENUE

Sharq Village & Spa
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Tuesday 15th April, 19:00hrs - 21:00hrs
Venue: SMAT Restaurant
Corniche Doha, near Rass Abu Aboud Signal, Orient Pearl, Doha, Qatar

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# NOTES

# UPCOMING
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