First EAGE Workshop on Characterization and Workflows for Giant Carbonate Field Developments of the Middle East

17-21 February 2019 • Abu Dhabi, UAE

Technical Programme
**SHORT COURSE**

**Sunday, 17 February 2019 08:00-17:00**

**Course Title:** Carbonate Reservoir Characterisation and Modelling  
**Instructors:** Professor Patrick Corbett, Heriot-Watt University  
**Location:** ADNOC HQ

**Course Overview**

This interdisciplinary 1-day course introduces modern reservoir modelling and reservoir engineering concepts to highlight and address the key challenges encountered when creating meaningful static and dynamic reservoir models of (fractured) carbonate reservoirs. The course is appropriate for a geoscientist, reservoir engineer, or petrophysicist working in integrated asset teams on (fractured) carbonate reservoirs, wishing to understand the challenges and approaches in characterising and modelling these complex reservoirs.

The course will cover the following aspects:
- Using case studies, we will review the challenges and new approaches to characterising and modelling (fractured) carbonate reservoirs  
- We will discuss the integration of core and log data for creating robust reservoir rock-typing approaches for carbonates  
- We will explain how fractures can be detected and incorporated in static and dynamic reservoir models  
- We will investigate how uncertainties in carbonate reservoir modelling can be quantified

**FIELD TRIPS**

**Thursday, 21 February 2019 08:00 - 17:00**

There will be 2 field trips taking place simultaneously on 21 February, for which the participation fee is included in the workshop fee. Attendees can only choose to attend 1 field trip.

**Field Trip 1: Carbonate Systems Developed in Active Tectonic Settings, Jebel Hafeet**

Complex stratigraphic patterns and facies changes with conglomeratic debris and stacked unconformities within Tertiary carbonates of the foothills of the Oman Mountains, eastern part of Abu Dhabi, UAE. A full-day excursion will examine the classic asymmetric Jebel Hafeet anticline, near Al Ain, around which the Rus-Asmari-Dammam carbonate sequences displaying depositional pattern through the interaction between structural growth and eustacy during the deposition of the shallow-marine carbonates. Furthermore, diagenesis (dolomitization), fracture geometries, and damage zones around faults can be observed and its impact on field development discussed. The excursion will be by bus and will start and end at the conference venue, Abu Dhabi.

**Field Trip 2: Coastal Sabkha Systems**

The primary aims and objectives of this field trip are as follows:
- To study recent arid depositional environments and relate their scale and geological complexities to producing reservoir in the adjacent subsurface  
- To view and discuss small and large-scale sedimentological and diageneric features and consider how these features may effect reservoir performance  
- To consider the effects of paleotopography on facies distribution and ultimately on spatial and temporal variations in reservoir quality.

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**TECHNICAL COMMITTEE**

- Christoph Lehmann (Co-chair)  
- Yousef Mousa (Co-chair)  
- Aita Bjaripour  
- Claire Gill  
- German Torres Lozada  
- Hesham Shebl  
- Henry Ewart Edward  
- Khalaf AlTemimi  
- Lyndon Yose  
- Martin Grimshaw  
- Matthieu Deville de Periere  
- Anis Seksaf  
- Michel Rebelle  
- Sebastian Geiger  
- Thomas Steuber  
- BP / ADNOC Onshore  
- Saudi Aramco  
- Weatherford  
- CGG GeoSoftware Middle East & North Africa  
- Schlumberger  
- ADNOC - Technical Center  
- ADNOC Offshore  
- ADNOC - Onshore  
- Schlumberger  
- ADNOC HQ  
- Saudi Aramco  
- Khalifa University - The Petroleum Institute  

**WORKSHOP OVERVIEW**

The Middle East hosts the world’s largest oil and gas fields with the majority of the hydrocarbons in place producing from carbonate reservoirs. These reservoirs cover a wide range of age and depositional environments and have often undergone a complex diagenetic, structural, and burial history. This often results in highly heterogeneous and multi-scale carbonate reservoirs which make field development challenging. Understanding these complex reservoirs, and how to best encapsulate the key static and dynamic properties in reservoir models, is important for everybody involved in producing hydrocarbons from these carbonate reservoirs.

Development and management of these giant fields require building predictive 3D reservoir models and demand the effective collaboration, from geoscientists to engineers. This multidisciplinary approach ensures that reservoir heterogeneity, flow characteristics, and fluid distribution are captured and honored in a dynamic model which will be used for strategic field development decisions.

Over three days, experts from industry and academia will discuss a series of multidisciplinary topics across a range of scales related to the production of hydrocarbons from giant carbonate reservoirs. The workshop intends to cover a breadth of topics, from basic core description, to building a static model, to reservoir simulation. The workshop will start at the well- and core-scale and attempts to arrive at understanding the flow behavior in the reservoir. The topics will build on existing workflows on reservoir characterization including core description, core analysis, rock typing, facies mapping, fracture characterization, seismic reservoir characterization, and outcrop analogues. These themes are the building blocks for the static reservoir models which are then translated into dynamic models.

The workshop will touch basis with the latest achievements in static reservoir modelling and dynamic reservoir simulation techniques, and will have a series of keynote lectures who will provide the context for the oral and poster presentations. Breakout sessions, discussions, and a core display will further keep the attendees engaged.
ICEBREAKER RECEPTION | Sunday 17 February
18:30 - 20:30 Breeze at the Pool, 23rd Floor, Dusit Thani

TECHNICAL PROGRAMME

Oral Presentations | Monday 18 February

EMERALD MEETING ROOM

08:00 Registration & Coffee
08:45 HSE Announcements
08:50 Opening Session (co-chairs)
09:00 Keynote Address - Mr. Ahmad Al Suwaidi (ADNOC)
09:30 Keynote Address - Dr. Asil Al Tawil (Saudi Aramco)
10:00 Coffee Break

Session 1: Outcrop Analogues to Define Geobodies for the Subsurface
T. Steuber (Khalifa University)
Y. Mousa (Saudi Aramco)

10:30 GCA01 - Carbonate Field Analogues of the UAE Applied to Abu Dhabi Oilfields (Part 1): Depositional Facies and Stratigraphy - C. Lehmann* (ADNOC/BP), E. Edwards (ADNOC)
11.10 GCA02 - Carbonate Field Analogues of the UAE Applied to Abu Dhabi Oilfields (Part 2): Multi-Purpose Application of Multi-Scale Stratigraphic Features - H.E. Edwards* (ADNOC), C. Lehmann (ADNOC / BP)
11.50 GCA03 - Stratigraphic forward Modelling of Upper Kharaih Ooid Shoal Migration in Ras Al-Khaimah (UAE) using CarboCAT - D.P. Gold (CGG), H. Xi (University of Liverpool), C. Gill* (GGI), P.M. Burgess (University of Liverpool)
12.30 Lunch

Session 2: Depositional, Diagenetic and Sequence Stratigraphic Models for Carbonates
C. Lehmann (BP / ADNOC Onshore)
K. Ternimi (Saudi Aramco)

13.50 GCA04 - Sequence Stratigraphic Based Facies Prediction Workflow of the Middle Jurassic Lower Fadhili Reservoir, Saudi Arabia - M. Fallatah* (Saudi Aramco)
14:30 GCA05 - Sequence Stratigraphic Framework of the Late Jurassic upper Hanifa Formation, Eastern Saudi Arabia - M. Alghamdi* (Saudi Aramco), M. Fallatah (Saudi Aramco)
15:10 Coffee Break
15:40 GCA06 - Facies Analysis, High-resolution Sequence Stratigraphy in the Epeiric Carbonate Platform, Khairib Fm., Western Margin of Abu Dhabi, UAE - K. Torres* (ADNOC Onshore), A. Magalhães (University of Lisbon), B.A. Balza (ADNOC Onshore)
16:20 GCA07 - Depositional and Diagenetic Controls of Carbonate Reservoir Property Distribution in a SuperGiant Reservoir, SE Iraq - B. Vincent* (Cambridge Carbonates), F. Wirkowski (Cambridge Carbonates), A. Horbury (Cambridge Carbonates), A. Chistyakov (LUKoil Engineering), V. Koloskov (LUKoil Engineering)
17:00 Close of Day

EMERALD MEETING ROOM

08:00 Morning Coffee
08:30 Wrap up Day 1 & Discussion Session

Session 3: Fracture Characterization and the Impact on Field Development
Y. Mousa (Saudi Aramco)
P. Corbett (Heriot-Watt University)

09:45 GCA08 - Understanding the Need for Fracture Modelling of Structurally-Enhanced Carbonate Matrix Reservoirs: Criticality of Initial Assessment - H. E. Edwards* (ADNOC)
10:25 Coffee Break + Poster Session

EMERALD FOYER

Poster Session

10:25 POS01 - Field-scale Characterization and Sequence Stratigraphy of the Middle Jurassic Upper Fadhili Reservoir, Saudi Arabia - M. Fallatah* (Saudi Aramco)
POS02 - Review of Facies Analysis and High-resolution Sequence Stratigraphy in the South Margin of Shuaib Formation, Abu Dhabi, UAE - K. Torres* (ADNOC Onshore), O. Ardelalen (ADNOC Onshore)
POS04 - Complex Approach for Predicting Reservoir Properties of the Carbonate Oil field in Zagros Province - S. Idriosa* (LLC Gazpromneft STC), S. Melnikov (LLC Gazpromneft STC), R. Rastegaev (LLC Gazpromneft STC), V. Morozov (LLC Gazpromneft STC)
POS05 - Advanced Evaluation Methods of Carbonate Rock Matrices- A Case Study on Major Hydrocarbon Reservoirs in the Middle East - Osama AlJallad* (Ingrain A Halliburton Service), Mustafa Demaika (Ingrain A Halliburton Service), Safouh Kornofol (Ingrain A Halliburton Service), Mohammad AlJabari (Ingrain A Halliburton Service)

Session 3: Fracture Characterization and the Impact on Field Development
Y. Mousa (Saudi Aramco)
P. Corbett (Heriot-Watt University)

11:05 GCA09 - Characterization and Modelling of Fractured and Matrix Carbonate Reservoirs: a Case Study from the Early Cretaceous Upper Shuaiba Member of Northwest Sultanate of Oman - S.A.K. Al Balushi* (Petroleum Development Oman)
11:45 GCA10 - Structural Synthesis of a Heavily Compartmentalized Reservoir - A. Salahuddin* (ADNOC Onshore)
12:25 Lunch

Session 4: Petrophysical Characterization of Carbonates Reservoirs, Rocks and Fluids
C. Gill (CGG Robertson Middle East & APAC)
A. Bijanipour (Weatherford)

14:10 GCA12 - Geological and Petrophysical Evaluations of Tatarat Heavy Oil Carbonate in Burgan Field, Kuwait - Laila Hayat (Kuwait Oil Company), Mishari Al-Qattan (Kuwait Oil Company), Osama Al-Jallad* (Ingrain A Halliburton Service), Mustafa Demaika (Ingrain A Halliburton Service), Safouh Koronofol (Ingrain A Halliburton Service), Anas Kayali (Ingrain A Halliburton Service), David Gonzalez (Ingrain A Halliburton Service)
14:50 Coffee Break

Session 5: Seismic Reservoir Characterization of Carbonates
H. E. Edwards (ADNOC Offshore)
A. Seksaf (Badley Ashton)

15:20 GCA13 - New Insights into Complex Carbonate Reservoirs through AVA Modelling and Facies-Constrained Stochastic Elastic Inversion - C.N. Oviawe* (ADNOC), S. A. Al Mesaabi (ADNOC), H. T. Shebl (ADNOC)
Session 7: Reservoir Simulation
S. Geiger (Heriot-Watt University)
A. Seksaf (Badley Ashton)

14:10 GCA21 - New Approach to Integrate the Diagenetic Facies with the Reservoir Rock Typing for 3D Modeling of Lower Cretaceous Carbonate Reservoir In UAE - Z. El Wazir* (ADNOC Onshore)

14:50 GCA22 - Characterization and Modeling of Transition Zones for the Carbonate Greenfield - A.S. Goncharov (Gazpromneft NTC. Ltd), M.A Butorina* (Gazpromneft NTC. Ltd), S.A Nekhaev (Gazpromneft NTC. Ltd), E.V. Zagrebelnyy (Gazpromneft Badra B.V.)

15:30 Coffee Break

16:00 GCA23 - History Matching and Multi-Objective Optimization of WAG injection in a Giant Carbonate Reservoir - S. Al-Ameri* (Heriot-Watt University), S. Geiger (Heriot-Watt University), M. Al-Beriki (Heriot-Watt University)

16.40 Discussion session & Workshop Summary
- Outcrop Analogues to Define Geobodies for the Subsurface
- Depositional, Diagenetic and Sequence Stratigraphic Models for Carbonates
- Fracture Characterization and the Impact on Field Development
- Petrophysical Characterization of Carbonates Reservoirs, Rocks and Fluids
- Seismic Reservoir Characterization of Carbonates
- Advances in Carbonate Reservoir Modelling
- Reservoir Simulation

17.15 Close of Workshop

SOCIAL PROGRAMME

Icebreaker Reception
Sunday 17 February, 18:00 – 20:00hrs
Breeze at the Pool, 23rd Floor
Dusit Thani

Workshop Dinner
Tuesday 19 February, 19:00 – 21:30hrs
Benjarong Thai Restaurant
Dusit Thani
OVERVIEW OF REGISTRATION FEES

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Please note:
The Registration fee includes the short course scheduled on 17 February and one of the Field Trips scheduled on 21 February. Upon registering, please indicate if you would like to attend the short course and/or field trips as seats are limited for these activities.

To qualify for the member registration fee, your EAGE membership dues for 2019 must have been paid and confirmed. The processing time for membership applications or renewals is 10 working days.

1. The non-member fee includes EAGE membership for 2019.
2. To qualify for the reduced student registration fee:
   - Students must be enrolled in a full-time study programme at a recognized university or institute
   - The registration must be accompanied by a copy of a student ID card and/or official proof of enrolment.
   - Please note: Student non-members can’t be older than 34 years of age (when registering)
3. Please note that EAGE reserves the right to cancel the event due to low participation. In this case, payment will be refunded in full.

VENUE – DUSIT THANI HOTEL

EAGE has negotiated room rates for delegates attending the First EAGE Reservoir Characterization and Modelling Workflows for Giant Carbonate Field Developments of the Middle East. Please note that these rooms are subject to availability - please contact Triinu (Event Manager, EAGE) tja@eage.org to check availability.

Dusit Thani Hotel
Address: 925 Sultan Bin Zayed The First Street (Al Muroor Road), Abu Dhabi, United Arab Emirates.
Phone: +971 (2) 698 8888
Email: info.abudhabi@dusit.com
Website: https://www.dusit.com/dusitthani/abudhabi/

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CONTACT

For more information on the workshop, please visit the event’s website or contact the EAGE Middle East & Africa office via middle_east@eage.org or +971 4 369 3897.
See you in Abu Dhabi!