

63rd SPWLA Annual Symposium

Stavanger, Norway

June 11- 15, 2022



The information in this brochure may change as planning progresses, it is recommended that delegates check the symposium website <https://www.spwlaworld.org/> periodically for updates as they become available.





General Chairman

Mathias Horstmann, *Schlumberger*

Co-general Chair

Torunn Hana, *Repsol*

Chair Social Functions

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Chair Publicity/ IT/ WEB, Technical Arrangements (venue)

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Stefano Pruno, *Stratum*

Bob Engelman, *Halliburton*

Transportation

Elin Solfjell, *PGNiG* (field trip)

Stefano Pruno, *Stratum* (offsite workshop)

Convention Liaisons

Sharon Johnson, *SPWLA*

Stephanie Turner, *SPWLA*



Welcome to Stavanger!

The 63rd Annual SPWLA Symposium

It is with great pleasure that the Norwegian Formation Evaluation Society, NFES, welcomes the 63rd Annual Symposium of the Society of Petrophysicists and Well Log Analysts to Stavanger, Norway.

We are excited to host all our members and friends of SPWLA in Scandinavia June 11th – 15th 2022, bringing our global technical community close together in the friendly Norwegian energy capital. Very much needed after these recent challenging years!

Norway and Stavanger is home to numerous national and international operators and service companies, leading academia and research institutes as well the National Petroleum Directorate.

Norway's geology and landscape, and its cultural history of the area give great opportunities for field trips and experiences for a lifetime. The long summer days in June allow for great social events and sport activities until late evening. Stavanger is a natural choice to see the most spectacular natural highlights of the Norwegian Fjord Region such as the amazing Pulpit Rock and the Kjerag Bolt. The Pulpit Rock has been nominated the "worlds' most spectacular viewpoints" by CNN & Lonely Planet. The Norwegian fjords are on the UNESCOs list of world heritages, and offers some of the most majestic and impressive scenery in the world.

Clarion Hotel Energy will be our main venue for SPWLA 2022. The hotel is within short distance of Stavanger centrum where you find numerous restaurants, shops, museums and activities that will make SPWLA 2022 a memorable event. The hotel offers high-level facilities with services at top quality level to make our stay comfortable and the conference engageable.

Stavanger, a world's known energy hub, being a center for trade, shipping and business has great connection through its international airport to the world. With this easy and short access all is in place for a successful and rewarding symposium.

Velkommen til Stavanger 2022!





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SYMPOSIUM HIGHLIGHTS

All functions will be held in Clarion Hotel Energy unless otherwise indicated. Please confirm exact location and timing prior to event from information available at registration.

Saturday, June 11

Registration	7:00 a.m. – 5:00 p.m.
Field Trip	7:30 a.m. – 7:30 p.m.
Workshop 1	9:00 a.m. – 5:00 p.m.
<i>Organic-Rich Shale Formation Evaluation: Making Sense of the Contradictions</i>	
Workshop 2	9:00 a.m. – 5:00 p.m.
<i>Machine Learning and Artificial Intelligence Within Petrophysics</i>	
Workshop 3 – Formation Testing	9:00 a.m. – 5:00 p.m.
Workshop 4	9:00 a.m. – 5:00 p.m.
<i>Steering and mapping with Ultra-Deep Look-Around & Look-Ahead Resistivity: a review of the principles, benefits, and latest innovations for both novel and experienced users</i>	
Workshop Luncheon	11:30 a.m. – 1:30 p.m.

Sunday, June 12

Registration	7:00 a.m. – 5:00 p.m.
Workshop 5 – Core viewing	9:00 a.m. – 5:00 p.m.
Workshop 6	9:00 a.m. – 5:00 p.m.
<i>The importance of Petrophysics in Resources and Reserves Estimation</i>	
Workshop 7	9:00 a.m. – 5:00 p.m.
<i>Subsurface Sequestration and Storage of Nuclear Waste and Carbon Dioxide (SAFE- Store Away ForEver)</i>	
Workshop 8	9:00 a.m. – 5:00 p.m.
<i>Introduction to Borehole Image Analysis</i>	
Student Paper Competition	8:00 a.m. – 5:00 p.m.
Speaker Preparation Center	7:30 a.m. – 5:00 p.m.
Technology Committee Meeting	5:00 a.m. – 6:00 p.m.
VP Publications Meeting	5:00 a.m. – 6:00 p.m.
Open Meeting	5:00 a.m. – 6:00 p.m.
Open Meeting	5:00 a.m. – 6:00 p.m.
Icebreaker Reception	6:30 p.m. – 9:30 p.m.

Monday, June 13

Speakers Breakfast	6:00 a.m. – 8:00 a.m.
Speaker Preparation Center	7:00 a.m. – 5:00 p.m.
Registration	7:00 a.m. – 5:00 p.m.
Spouse/Guest Hospitality Suite	7:30 a.m. – 5:00 p.m.
Exhibition	9:00 a.m. – 5:00 p.m.
Opening Remarks	8:00 a.m. – 9:30 a.m.
Spouse/Guest	7:45 a.m. – 5:00 p.m.



Morning Technical Sessions
Annual Business Meeting & Lunch
Poster Authors in Booth
Afternoon Technical Sessions

9:00 a.m. – 11:45 a.m.
11:45 a.m. – 1:00 p.m.
1:10 p.m. – 1:30 p.m.
1:50 p.m. – 5:30 p.m.

Tuesday, June 14

Speakers Breakfast
Speaker Preparation Center
Registration
Spouse/Guest Hospitality Suite
Exhibition
Spouse/Guest Day Tour
Morning Technical Sessions
Awards Presentation and Lunch
Poster Authors in Booth
Afternoon Technical Sessions

6:00 a.m. – 8:00 a.m.
7:00 a.m. – 5:00 p.m.
7:30 a.m. – 5:00 p.m.
7:45 a.m. – 5:00 p.m.
9:00 a.m. – 5:00 p.m.
9:30 a.m. – 3:30 p.m.
8:00 a.m. – 11:45 a.m.
11:45 a.m. – 1:00 a.m.
1:10 p.m. – 1:30 p.m.
1:50 p.m. – 5:30 p.m.

Wednesday, June 15

Speakers Breakfast
Speaker Preparation Center
Registration
p.m.
Spouse/Guest Hospitality Suite
Exhibition
Morning Technical Sessions
Spouse/Guest Day Tour
Lunch Break – On your own
Leadership Lunch
Poster Authors in Booth
Afternoon Technical Sessions –
Closing Remarks and Door Prize Drawing

6:00 a.m. – 8:00 a.m.
7:00 a.m. – 5:00 p.m.
7:30 a.m. – 12:00
7:45 a.m. – 5:00 p.m.
9:00 a.m. – 3:00 p.m.
8:00 a.m. – 11:45 a.m.
9:00 a.m. – 5:30 p.m.
11:45 a.m. – 1:00 p.m.
11:45 a.m. – 1:00 p.m.
1:00 p.m. – 1:20 p.m.
1:30 p.m. – 5:30 p.m.
5:30 p.m.

Symposium Sponsors

SPWLA thanks the following sponsors of the 63rd Annual Symposium:

Baker Hughes 

 **AkerBP**


equinor

 **Eriksfiord**

Logtek
Petroware

HALLIBURTON

 **Maxwell**
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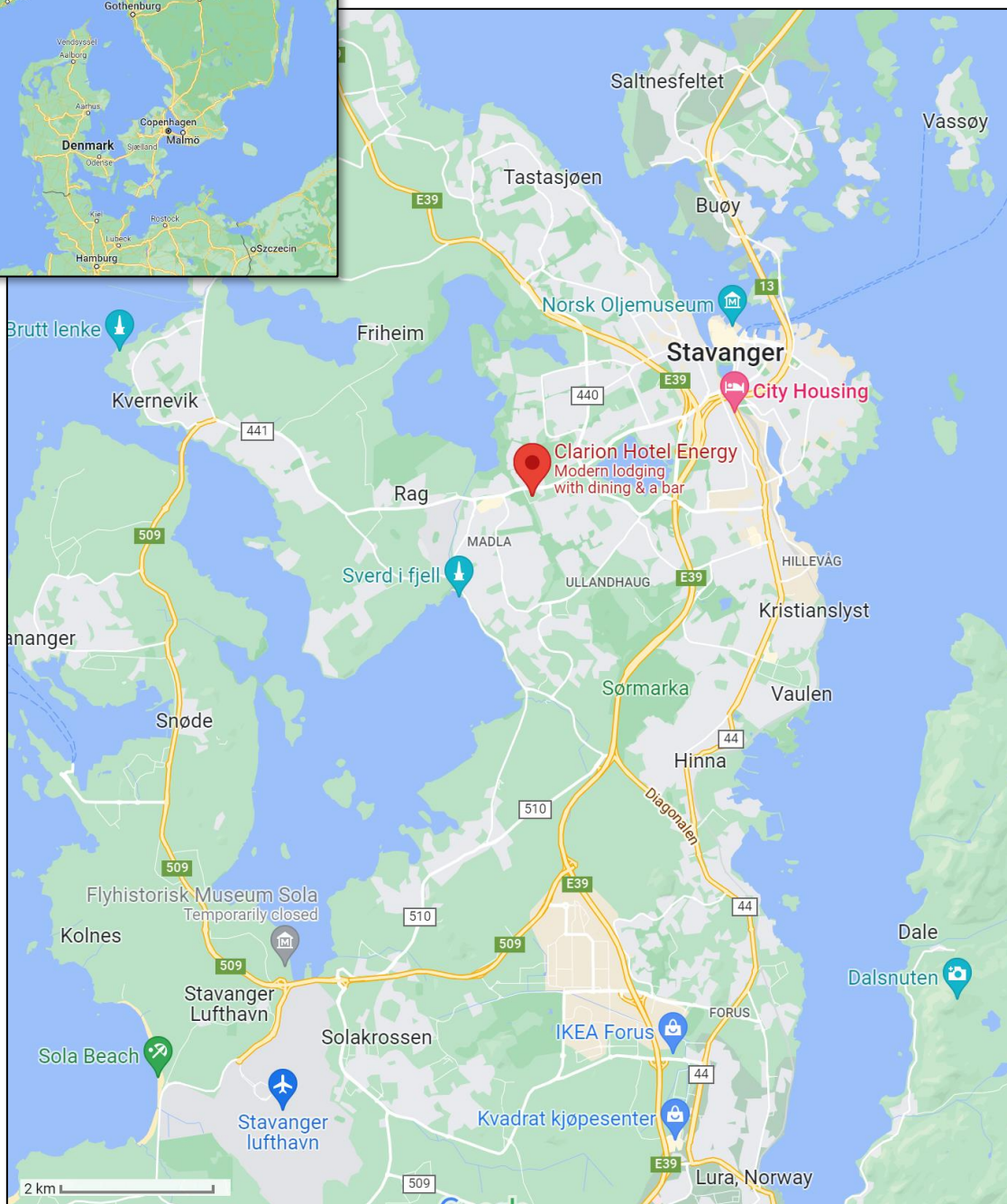
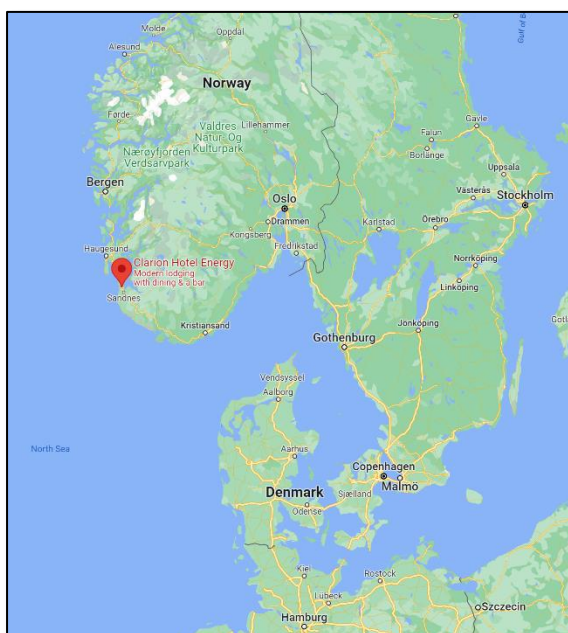
Host Venue: Hotel and Conference Center

Stavanger is known as Norway's energy capital – the town is simply electric. Come take part in the city's old town, its bustling shopping district, the regions majestic natural area and sporting events. The Clarion Energy is located at Stavanger Forum in the Madla area, just few minutes from the center and old town. Our hotel is the largest conference hotel in Stavanger, opened just in 2014 – designed by Snøhetta, a worldwide renown Norwegian architectural firm.

To start again with a "real" in person venue, we in NFES choose with the board of directors a hotel setup for an intimate meeting in this almost new and stylish 4-star conference hotel. The hotel is only a short distance from down-town Stavanger where you find numerous restaurants, shops, museums and activities – altogether it will make SPWLA 2022 a memorable event!

Clarion Hotel Energy, Ishockeyveien 2, 4021 Stavanger.





Transportation – Getting to Stavanger

Stavanger has an international airport with direct flights from destinations worldwide, including major hubs such as Amsterdam, Frankfurt, London, Copenhagen, and the energy hub of Aberdeen.

The internationally connected [Stavanger Airport Sola \(SVG\)](#) is located only few kilometers from Stavanger; it is accessible by taxi (~15min), an airport bus (~20 min, [“flybussen”](#)), and public bus lines (~40 min, [Kolumbus](#)). There are also many international car rentals in the terminal building.

Stavanger has for centuries been a center for trade, shipping and business, and international networks. Therefore, the city is also connected with international ferry lines – an option for delegates from Continental Europe to experience a remarkable road trip to possibly explore Norway further. The main ferry routes are Hirtshals (Denmark) with [Fjord Line](#) offering a directly overnight crossing to. Alternatively, [Holland Norway Lines](#) runs a service between Eemshaven/Groningen, The Netherlands and Kristiansand. From Kristiansand, a scenic drive of ca 3.5h will bring you to Stavanger.

Transportation – Getting around in Stavanger

All offsite events, being it the field trip, technical workshops or social evenings will provide transportation on designated coaches directly leaving at the Hotel. If you want to experience the town on your own or just want to get around, we recommend using [public transportation](#) which is very safe, reliable, and easy to use in Norway. The communal owned Kolumbus company with its green LPG or electrically powered vehicles, will bring you literally almost everywhere. There is a bus stop almost directly in front of the hotel lobby with many lines going down-town in the center. We recommend to use a 24h or a 7 day ticket which both allow you to use all Kolumbus' busses, local trains within the zone(s) you have paid for, and even some ferries. [Kolumbus also rents out bikes](#), a very convenient way to get around in Stavanger where distances are short! Taxis are also easily available – though they can be somewhat costly. It may be a viable option to share one from downtown to the hotel with some peers.





General Information

Note: All events take place at the Clarion Hotel Energy unless indicated otherwise.

Registration

Registration for all attendees, spouses and guests will be located in the Clarion Hotel Energy Assembly. Dates and time:

Saturday, June 11	7:00 a.m. - 5:00 p.m.
Sunday, June 12	7:00 a.m. - 5:00 p.m.
Monday, June 13	7:00 a.m. - 5:00 p.m.
Tuesday, June 14	7:30 a.m. - 5:00 p.m.
Wednesday, June 15	7:30 a.m. - 12:00 noon

Exhibition

The exhibition will be in the lobby and hall 3 of the Clarion Hotel Energy. Exhibit hours are:

Monday, June 13	7:00 a.m. - 5:00 p.m.
Tuesday, June 14	7:30 a.m. - 5:00 p.m.
Wednesday, June 15	7:30 a.m. - 3:00 p.m.

Please note: For safety consideration, no one under the age of 13 will be allowed in the exhibit hall.

Opening and Special Guest Session

Monday, June 13, 8:00 a.m.

Join us as General Presiding Officer, Mathias Horstmann, President of the Norwegian Formation Evaluation Society (NFES) officially opens the SPWLA 63rd Annual Logging Symposium with brief opening remarks and the introduction of our keynote speaker.

To set the stage, SPWLA and NFES are honored that Ms. Kristin Fejerskov Kragseth, CEO of Petoro, will share her thoughts on the role of the O&G industry in the ongoing energy transition – where Norway is leading the way in at times polarizing debates once more. Being in various executive roles, Kristin will also touch on her leadership experiences and chances a diverse, gender-balanced and inclusive culture provide, helping to attract the best talents for the future energy industry.

Ms. Kragseth graduated with a master's degree in marine engineering at Texas A&M University. With now nearly 30 years' experience from the oil and gas industry, Kristin joined Petoro last year from the CEO position of Vår Energi. Before that, she has worked as Vice President for Production in Point Resources and as a Technical Manager for ExxonMobil on



the Norwegian Continental Shelf. She has also held several positions within ExxonMobil, both nationally and internationally. Petoro is a driving force offshore Norway, as it manages the Norwegian State interests and its substantial holdings in several oil and gas fields, pipelines and land facilities on the NCS.

Immediately following, SPWLA Vice President of Technology, Dr. Carlos Torres-Verdin will officially open the technical session.

Ms Kristin F. Kragseth, CEO of Petoro



Speakers and Session Co-Chairpersons Meeting

Pre-conference meeting for All Speakers and Session Co-Chairpersons on the morning of your presentation. The Committee will have a Q&A session, test the equipment, and explain the program procedures.

TIME: 7:00 a.m. – 8:00 a.m. Monday through Wednesday

LOCATION: Opportunity meeting room

Speaker Preparation Center

All speakers are encouraged to view their presentation in the Preparation Center and have their file checked by the projectionist at their earliest convenience. The Preparation Center will provide a computer for speakers to load their PowerPoint® presentations onto the symposium's computer network and verify compatibility and consistency with the system. The Preparation Center is open Sunday through Wednesday, 7:00 a.m. to 5:00 p.m.

Poster Presentations

Posters will be on display on the second floor of the Energy Center Monday, Tuesday and Wednesday with a dedicated session times each day.



Exhibition

The following companies will have booths at the exhibition:

Baker Hughes



Eriksfiord

GEOLOG



Laboratories
A division of Green Imaging Technologies

HALLIBURTON



Logtek
Petroware



Lloyd's
Register



Petromac WIRELINE EXPRESS



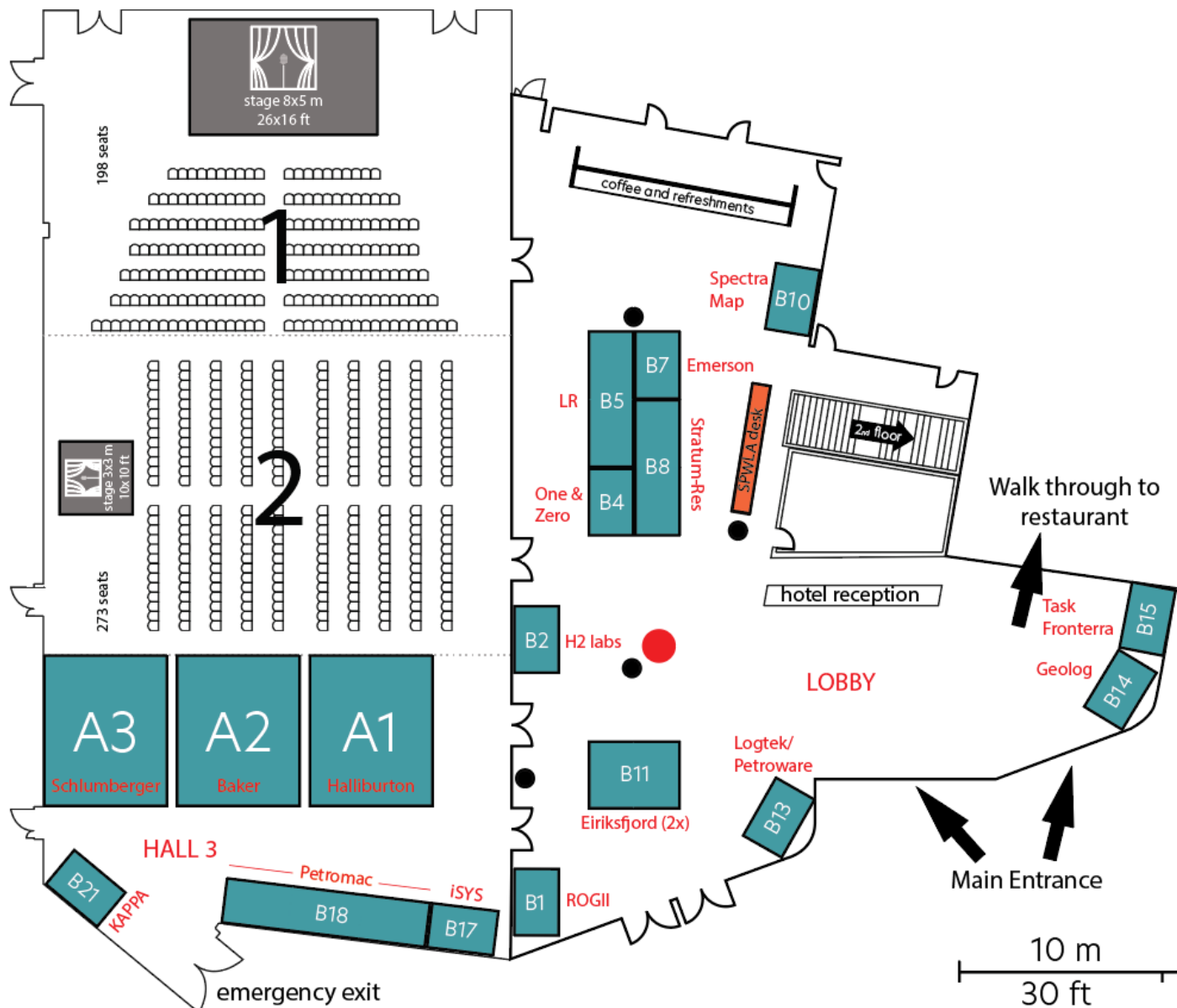
TASK Fronterra
GEOSCIENCE



STRATUM
RESERVOIR

Schlumberger

The exhibition floorplan:





SPWLA Technology Committee 2021-22

Vice-President Technology

Carlos Torres-Verdín PhD, University of Texas Austin

Technical Program Co-Chair

Iulian Hulea PhD, Shell

Committee Members

Adam Haecker, Continental Resources/SPWLA VP Finance

Alessandra Simone, Consultant and University of Houston

Austin Boyd, Federal University of Rio de Janeiro

Bob Gales, Halliburton

Chicheng Xu, Aramco Americas

Chris Skelt, Independent Consultant

Don Clarke, ExxonMobil

Douglas A. Boyd, ADNOC

Elsa Maalouf, American University in Beirut

Essi Kwabi, Apache

Giuseppe Galli, ENI SpA

Harry Xie, Core Lab/SPWLA VP IT

Hendrik Rohler, Petrom

Irada Yusufova, Equinor

Javier Miranda, DeGolyer and MacNaughton

Joe Comisky, Devon Energy

John Zhou, Maxwell Dynamics

Kavita Agarwal, Petroleum Development Oman

Kelly Skuce, Core Petrophysical Consulting

Lalitha Venkataramanan, Schlumberger

Lori Hathon, University of Houston

Luis Quintero, Halliburton

Marco Pirrone, ENI SpA

Marie Van Steene, Schlumberger

Mark Ma, Saudi Aramco

Marvin Rourke, GoWell

Mathilde Luycx, ExxonMobil/SPWLA VP Social Media

Matthew G. Reppert, Neptune Energy

Michel Claverie, Consultant

Nazanin Jahani, NORCE

Per-Atle Olsen, Equinor

Sanaz Javid, Lundin Energy

Shelby Plitzuweit, OXY

Siddharth Misra, Texas A&M University

Stephanie Perry, GeoMark

Tom Bradley, Baker Hughes

Zoya Heidari, UT Austin



Technical Program

*NOTE: Tentative Program: Selected papers listed below may not be in the order in which they will be presented. The final technical program may differ from that shown due to paper withdrawals. All technical sessions will be held at the **Clarion Hotel Energy**. Photography and video/audio recording of any kind are strictly prohibited in all areas, including technical sessions, workshops, and exhibition hall.*

AUTOMATED METHODS OF FORMATION EVALUATION

A Comparative Study for Machine-Learning Methods for Log Prediction

Vanessa Simoes, Hiren Maniar, Aria Abubakar, Tao Zhao, Ridvan Akkurt, and Atul Katole, Schlumberger

A Novel Automated Machine-Learning Model for Lithofacies Recognition

Jianhua Gao and Qiong Zhang, University of Electronic Science and Technology of China

Automated Core Analysis Sample Selection Using Early-Time Non-Invasive Measurements

Ajayendra (AJ) Kumar, Thomas Pugh, Kory Holmes, and Patrick Huff, Core Laboratories; Brett Wendt, Adam Lewis, Tunde Akindipe, Gregory Wilson, and Heather Perfetta, ConocoPhillips

Automatic Badlog Detection - A Key to Successful Digitalization in Subsurface

Kjetil Westeng, Aker BP; Flávia Dias Casagrande, Inmeta; Saghar Asadi, Peder Aursand, Nils André Aarseth, Tanya Kontsedal, and Håvard Kvåle Simonsen, Aker BP

Class-Based Machine Learning for Intelligent Reservoir Characterization Over the Life Cycle of a Field in the North Sea

Subhadeep Sarkar, Vikas Jain, and Mathias Horstmann, Schlumberger; Renee Aleixo, Odd Senneseth, and Carly Marshall, Neptune Energy

Deep Learning for Multiwell Automatic Correction

Vanessa Simoes, Aria Abubakar, Hiren Maniar, and Tao Zhao, Schlumberger

Embedding Artificial Intelligence on LWD Images for Automated Drilling Optimization

Ana Escobar, Josselin Kherroubi, Daniel Quesada, Nadege Bize-Forest, Chandramani Shrivastava, Mathieu Tarrus, and Exequiel Padin, Schlumberger

Estimation of Matrix Properties From Geochemical Spectroscopy Logs Using Machine Learning

Vasileios-Marios Gkortsas, Paul Craddock, and Jeffrey Miles, Schlumberger-Doll Research; Harish Datir, Schlumberger; Lalitha Venkataramanan, Schlumberger-Doll Research

Multiscale and Multiphysics Quantitative Workflow for Integrated and Image-Assisted Rock Classification in Complex Carbonate Formations

Andres Gonzalez and Zoya Heidari, The University of Texas at Austin

Sonic Data Classification Using Supervised Machine-Learning Approach

Ting Lei, Schlumberger; Daniel Al Choboq, MINES ParisTech; Josselin Kherroubi, Lin Liang, and Romain Prioul, Schlumberger

Uncertainty in Automated Well-Log Correlation Using Stochastic Dynamic Time Warping

Mustafa A. Al Ibrahim, Saudi Aramco



CASE STUDIES

A New Approach to Model Saturation Below Free Water Level, A Case Study From a Giant Reservoir in the Middle East

Syofvas Syofyan, ADNOC Onshore; Christophe Darous, Schlumberger; Tariq Ali Al-Shabibi, Asma Hassan Ali Bal Baheeth, Fitra Adlan, Saif Ghanim Al-Shamsi, Hamad Khaled Aljanaahi, Ashraf Lotfy El Gazar, and Anurag Grover, ADNOC Onshore; Ishan Raina, Schlumberger

A Step Change in Lower Shuaiba Reservoir Facies Interpretation Triggers New Discoveries

Fathiya Battashi, Nasser Ghazali, Mazin Amri, Khalsa Shukri, and Rinat Lukmanov, Petroleum Development Oman

Defining Geologic Structure Encountered in Horizontal Well and Its Impact on Petrophysical Evaluation

Bo Su, China National Logging Corporation; Huafeng Ni and Zhongyuan Shi, CNPC Chuanqing Drilling Engineering Company Ltd.; Kecai Guo, Mingyu Lu, and Yongdi Zhang, China National Logging Corporation; John Zhou, Maxwell Dynamics, Inc.

Exploring the Downhole Waterways: Identification of the Sneaky Path of Water Through the Well Completion

Giuseppe Galli, Marco Pirrone, Nicola Pirola, and Luca Parodi, Eni SpA; Maximiliano Guiducci and Maciej Kozłowski, Halliburton

Extracting More Value From Basic Casedhole Services - Deriving Confident Formation Slowness Measurements From Simple Cement Evaluation Services

Tom Bradley, Baker Hughes, and Brice Fortier, Equinor ASA

Fluid Monitoring in a Large Field in North Oman to Maximize Ultimate Recovery

Kavita Agarwal, Kholood Nofli, Yusra Daoudi, and Timothy Duggan, PDO

Improving Reservoir Exposure in Thin Heterogeneous Carbonera Formation With the New Multilayer-Mapping-While-Drilling Technology: A Case Study

Egor Kovarskiy, Guillermo Cuadros, Zoriana Snovida, Eliana Beltran, and Ettore Mirto, Schlumberger

Naturally Fractured Carbonate Reservoir Characterization: A Case Study of a Mature High-Pour Point Oil Field in Hungary

Muhammad Nur Ali Akbar, István Nemes, Zsolt Bihari, Ágnes Bárány, László Tóth, Helga Soltész, and Szabolcs Borka, MOL Hungary

Shale Stability Modeling in Horizontal Section Using Synthetic Compressional and Shear Slowness: A Case Study From Duva, North Sea

Devendra Kumar, Schlumberger; Renee Aleixo, Rutger Van der Vliet, and Sylvain Clerc, Neptune Energy; Joao Paulo Castagnoli, Diego Munoz Sanchez, and Haitham Khalil Hassan, Schlumberger

Vendor-Independent Stochastic Inversion Models, Case Studies From the Norwegian Continental Shelf

Alexandra Zaputlyaeva, Danil Nemuschenko, and Mikhail Sviridov, ROGII



CORE AND WELL-LOG INTEGRATION

A New Method of Integrating Rockphysics and Geomechanics for Simulating Deformable and Permeable Behavior of Tight Carbonate for Optimized Reservoir Development

Umesh Prasad, Amer Hanif, and Pranjal K. Bhatt, Baker Hughes; Hayat Abdi Ibrahim Jibar, Karem Alejandra Khan, and Andi Ahmad Salahuddin, ADNOC Onshore

Core Multimineral Modeling Based on XRF, XRD, and Pyrolysis Data

Alexander Kolomytsev, Gazprom Neft, and Polina Maglevannaia, Skolkovo Institute of Science and Technology

Data-Driven Algorithms for Image-Based Rock Classification and Formation Evaluation in Formations With Rapid Spatial Variation in Rock Fabric

Andres Gonzalez and Zoya Heidari, The University of Texas at Austin; Olivier Lopez, Equinor

Improving the Calculation of Petrophysical Properties in Vugular Carbonates Using Logs and Rock Samples: A Case Study in a Brazilian Presalt Well

Lucas Abreu Blanes de Oliveira, Leonardo Gonçalves, Bernardo Coutinho Camilo dos Santos, William Andrighetto Trevizan, and Rodolfo Araujo Victor, Petrobras

Linking SCAL, RCAL, Digital Rock, and Petrography to Understand Sor in Presalt Carbonates

Ronaldo Herlinger Junior, Unicamp, Petrobras S.A.; Alexandre Campana Vidal, Unicamp

FORMATION EVALUATION OF CONVENTIONAL RESERVOIRS

A Generalized Geometrical Factor Model for Conductivity in Archie Rocks

W. David Kennedy, QED-Petrophysics LLC

A New Approach to Estimate Archie Parameters m and n Independently From Dielectric Measurements

Salah Al-Ofi, Baker Hughes; Shouxiang Ma, Saudi Aramco; Fei Le, Hasan Kesserwan, Guodong Jin, Amer Hanif, and Elton Frost, Baker Hughes

A Systematic Workflow of Optimum Log Data Acquisition and Integrated Formation Evaluation of Laminated Sand-Silt-Clay Deepwater Reservoir - A Case Study From Offshore Malaysia

Saikat Das, Viet H. Nguyen, Fadzilazri Shapie, and Stephen Dymmock, Baker Hughes; Amirul Afiq Yaakob, Amirah Thaqifah Mahamud, Siti Najmi Farhan Zulkipli, Dzulfadly Johare, and M. Fazli Izham Zakaria, Petronas Carigali Sdn. Bhd

Context and Distribution Matrixes - One Path to Consistent and Efficient Handling of Uncertainty in Formation Evaluation

Kjetil Westeng and Yngve Bolstad Johansen, Aker BP

Deep Salinity-Independent Water Saturation From Low-Frequency-Dielectric Rock Properties

Scott J. Jacobsen, NoHiddenPay LLC; Keith Bartenhagen, EOG Resources; Barbara I. Anderson, Frank Shray, James Hemingway, Eric Decoster, and Peter R. Swinburne, NoHiddenPay LLC

Dielectric Inversion of LWD Propagation Resistivity Tools for Formation Evaluation

Barbara I. Anderson and Frank Shray, NoHiddenPay LLC; Keith Bartenhagen, EOG Resources; James Hemingway, Eric Decoster, Peter R. Swinburne, and Scott J. Jacobsen, NoHiddenPay LLC



Downhole Detection and Geological Prediction of Halite Cement

Richard Bootle, Consultant; Adam Moss, AKM Geoconsulting Ltd; Jenny Omma, Rocktype Ltd

Enhanced Assessment of Water Saturation in Carbonate Formations Honoring Complex Pore Structure: A New Insight Into Physics-Based Calibration

Almostafa Alhadi, Zulkuf Azizoglu, and Zoya Heidari, The University of Texas at Austin

Formation Permittivity and Conductivity Simulation From Petrophysical Volumetric Analysis

Scott J. Jacobsen, Eric Decoster, James Hemingway, Frank Shray, Barbara I. Anderson, and Peter R. Swinburne, NoHiddenPay LLC

Heavy End Analysis by Ultrahigh Resolution Mass Spectrometry in Oils and Tars in Two Adjacent Reservoirs

Mareike Noah, GEOS4; Rolando di Primio, Lundin; Julia Forsythe, Sabine Mehay, Shawn Taylor, Vladislav Achourov, and Oliver C. Mullins, Schlumberger; Brian Horsfield, GEOS4

Integrated Analysis of NMR and Electrical Resistivity Measurements for Enhanced Assessment of Throat-Size Distribution, Permeability, and Capillary Pressure in Carbonate Formations: Well-Log-Based Application

Howard August, Zulkuf Azizoglu, and Zoya Heidari, The University of Texas at Austin; Leonardo Goncalves, Lucas Abreu Blanes de Oliveira, Moacyr Silva do Nascimento Neto, and Rodolfo Araujo Victor, Petrobras

Integrating the Thomas-Stieber Analysis With a Staged Differential Effective Medium Model for Saturation Interpretation of Thin-Bedded Shaly Sands

Andres Villarroel, Michael T. Myers, and Lori A. Hathon, University of Houston

Laboratory Investigation and Numerical Simulation of Spontaneous Potential Suppression in Oil Reservoirs

Joshua Bautista-Anguiano, Independent Consultant, and Carlos Torres-Verdín, The University of Texas at Austin

Linking Acoustic, Electrical, and Hydraulic Tortuosity to Predict Permeability and Formation Factor

Vimal Saxena, RockLog Consultancy

Machine-Learning-Based Deconvolution Method Provides High-Resolution, Fast Inversion of Induction Log Data

Teruhiko Hagiwara, Aramco Americas

New Development in Pulsed-Neutron Technologies to Enhance Faster Data Recovery and Reduce Operation Logging Time for Three-Phase Saturation Analysis in Fresh Environment

Roberto Nardiello, Pius Akagbosu, Salim Ouadah, Vijay Ramaswamy, and David Chace, Baker Hughes Nigeria; Emmanuel Toumelin, Ajibola Oduwole, Matthew E. Ogofa, and Oyie Maureen Ekeng, Chevron Nigeria Limited

Permeability Predictions From Dielectric Dispersion Logs Using Supervised Machine Learning: A Johan Sverdrup Field Example

Jan Henrik Norbistrath, Equinor

Quantification of Adsorption of Water on Clay Surfaces and Electrical Double Layer Properties Using Molecular Simulations

Isa Silveira de Araujo and Zoya Heidari, The University of Texas at Austin



Quantifying the Effects of Heavy Minerals on Thermal Neutron Porosity in Permo-Carboniferous Sandstone

Olusegun Akinyose and Tariq Alshaikhmubarak, Saudi Aramco; Laurent Mosse and Marie Van Steene, Schlumberger

Simultaneous Assessment of Water Saturation and Water Salinity From the Joint Multifrequency Interpretation of Real and Imaginary Parts of Dielectric Permittivity Measurements

Zulkuf Azizoglu and Zoya Heidari, The University of Texas at Austin

Sourceless LWD Borehole Acoustics: Field Testing the Concept

Alexei Bolshakov, Kristoffer Walker, Andee Marksamer, Lorelea Samano, and Andrew Reynolds, Chevron

The Impact of Fractures on Producibility and Completions in the Wafra Maastrichtian Reservoir

Sunday Adole, Ting Li, Peter Wilkinson, Bambang Gumilar, Joshua Azobu, Andrew Ranson, Yegor Se, Jim Turner, and Karen Whittlesey, Chevron U.S.A. Inc.

Ultradeep 3D Electromagnetic Inversion for Anisotropy, a Guide to Understanding Complex Fluid Boundaries in a Turbidite Reservoir

Nigel Clegg, Supriya Sinha, and Karol Riofrio Rodriguez, Halliburton; David Marchant, Computational Geosciences Inc; Stig Stig Sviland-Østre, Theodor Lien, and Joanna Mouatt, Aker BP; Christoph Schwarzbach, Computational Geosciences

Use of High-Resolution Imaging With Pore-Scale Determination of Wettability to Validate Pore-Scale Models

Mohammad Javad Shojaei, Imperial College London; Nathan Lane, BP America Inc; Bilal Rahid, BP Exploration; Martin J. Blunt, and Branko Bijeljic, Imperial College London

FORMATION EVALUATION OF UNCONVENTIONAL RESERVOIRS

A Multidisciplinary Approach to Unconventional Petrophysical Reservoir Integrated Saturation Measurements

Omar Reffell, Z. Harry Xie, Humberto Carvajal-Ortiz, and Joe Ramoin, Core Laboratories LP

A New Uranium Imaging Technique Based on Four-Detector LWD Natural Gamma Ray Spectrometry Logging Apparatus

Zhiyuan Liu, Feng Zhang, Qixuan Liang, and Jilin Fan, China University of Petroleum – East China; Zhen Yang, SINOPEC Matrix Corporation

A Quantitatively Determining Gas Saturation Method Using Pulsed-Neutron Element Logging in Tight Gas Reservoirs

Feng Zhang, Hui Zhang, Fei Qiu, and Qian Chen, China University of Petroleum – East China

Bridging Scales of Fracture Characterization Through Conventional Log Measurement.

Yasmina Bouzida, Gulzira Z. Zhunussova, Jeremy Riou, Tim Salter, and Eduardo Caeneuue, Baker Hughes; Nadjib Cherif and Amar Benaïda, Sonatrach

Comprehending Complex Conglomerates from the Norwegian Continental Shelf - A Deep Reservoir Understanding Through Integrated LWD-Based Petrophysics



Subhadeep Sarkar, Schlumberger; Sven-Erik Foyn, Lundin Energy; Vikas Jain, Mathias Horstmann, and Anup V. Thorat, Schlumberger

Effects of Near-Wellbore Supercharging and Hydro-Mechanical Coupling on Pressure Response for Formation Testing While Drilling

Nian Peng, Tianshou Ma, Ping Chen, and Yu Qiao, Southwest Petroleum University

Enhanced Assessment of Water Saturation in Organic-Rich Mudrocks Incorporating the Vertical Heterogeneity Through Resistivity Image Logs

Sabyasachi Dash and Zoya Heidari, The University of Texas at Austin

Integrated Petrophysical Evaluation of Unconventional Formations, in the Delaware Basin, With a Customized NMR Acquisition

Christopher Savage, Point Energy Partners; Stephanie Perry, GeoMark Research; Azeem Chohan, Rex Sy, and Milton Mendez, Baker Hughes

Integration Of Time-Lapse Geochemistry to Enhance Subsurface Characterization at Hydraulic Fracture Test Site II

Adam Turner, Catherine Donohue, and Alex Zumberge, GeoMark Research LTD.; Kanay Jerath, Daniel Rivas, and Ruben Lopez, Occidental Petroleum Corporation

Quantifying Interfacial Interactions Between Minerals and Reservoir/Fracturing Fluids and Their Impacts on Wettability Variation

Isa Silveira de Araujo and Zoya Heidari, The University of Texas at Austin

Quantifying the Impacts of Rock Components and Their Spatial Distribution on Estimates of Hydrocarbon Reserves in Organic-Rich Mudrocks

Sabyasachi Dash and Zoya Heidari, The University of Texas at Austin



SPECIALIZED MEASUREMENT TECHNIQUES AND INTERPRETATION METHODS

A Multiphysics While-Drilling Tool Integrates Continuous Survey, Gamma Ray Image, Caliper Image, and More

Jiaxin Wang, Bogdan Wiecek, Matthew Leung, Tim Parker, Rodney Marlow, and Paul Cooper, Halliburton

A New Pulsed-Neutron Apparatus Combined With Computed Tomography for Rapid, In-Situ Analysis of a Core Sample Inside a Core Barrel

Grant Goodyear, Derek R. Beckett, and Ajayendra (AJ) Kumar, Core Laboratories; Theodore J. Griffin Jr., EnCore Petrophysics; Kent E. Newsham and Milomir Pavlovic, Occidental Petroleum; Roland Chemali, Consultant

A Novel Gamma-Thermal Neutron Evaluating Gas Saturation Method Using Pulsed-Neutron Logging Tool With Dual-CLYC

Qixuan Liang, Feng Zhang, Junting Fan, Hui Zhang, and Weizheng Shang, China University of Petroleum – East China

A Novel Interpretation Model for Casedhole Density Measurement

Yulian Li, University of Electronic Science and Technology of China; Ya Jin, Decheng Niu, and Yuexin Meng, China Oilfield Services Limited; Feng Liu, China National Offshore Oil Corporation; Yating Hu and Qiong Zhang, University of Electronic Science and Technology of China

A Well Cementation Evaluation Method by the Azimuthal Gamma Combination With the Acoustic Logging in Horizontal Well

Jilin Fan, Feng Zhang, Haochen Song, Luyu Zhong, and Qian Chen, China University of Petroleum-East China

An Efficient and Effective Algorithm for Reservoir Boundaries Mapping

Peng Chen, Jun Wang, Jiaqi You, and Shijia Chen, China National Logging Corporation; Shanjun Li and John Zhou, Maxwell Dynamics, Inc.

An Innovative and Reliable Method of Estimating Rock Strength From Drilling Data Acquired Downhole

Umesh Prasad, William Anthony Moss, David Gavia, Hatem Oueslati, and Amer Hanif, Baker Hughes; Paul Pastusek, ExxonMobil UIS

Assessment of True Formation Resistivity and Water Saturation in Deeply Invaded Tight-Gas Sandstones Based on the Combined Numerical Simulation of Mud-Filtrate Invasion and Resistivity Logs

German Merletti, Salim Al Hajri, Michael Rabinovich, and Russell Farmer, BP; Mohamed Bennis and Carlos Torres-Verdín, The University of Texas at Austin

Casedhole Logging: The Development and Field Results of a New Drillpipe-Conveyed Casing Inspection and Cement Mapping Tool

Mike Andrew, Equinor; Andrew Hawthorn, Roger Steinsiek, and Shaela Rahman, Baker Hughes



Conceptual Through Casing Resistivity Tool and Its Prototype Results

Shanjun Li and Weishan Han, GeoPrance, LLC; Zhanshan Xiao and Haitao Hu, China Petroleum Logging Co.

Connectivity Assessment of Heavily Compartmentalized Reservoirs: A New Workflow Introducing Areal Downhole Fluid Analysis and Data Integration

Tarek Mohamed and Carlos Torres-Verdín, The University of Texas at Austin; Camilo Gelvez, BP America; Oliver C. Mullins, Schlumberger

Deep-Directional Resistivity Ranging for Near-Parallel Cased Well in Scenarios Either Vertical or Horizontal to Formation Layers

Yong-Hua Chen, Saad Omar, Lin Liang, and Diogo Salim, Schlumberger

Enabling Technologies for Dynamic Reservoir Evaluation and Extended Pressure-Transient Testing for the Low Carbon Transition

Richard Jackson, Chen Tao, Nataliya Mayzenberg, Hadrien Dumont, Francois Dubost, and Adriaan Gisolf, Schlumberger

Extended Fractional Flow Theory for Steady-State Relative Permeability Experiments With Capillary End Effects - Transient Solutions and Time Scales

Pål Østebø Andersen, University of Stavanger and The National IOR Centre of Norway

Flow-Dependent Relative Permeability Scaling for Steady-State Two-Phase Flow in Porous Media: Laboratory Validation on a Microfluidic Network

Marios Valavanides, University of West Attica; Nikolaos Karadimitriou and Holger Steeb, University of Stuttgart

Integrated Approach to Leak Detection Using High-Definition Electromagnetic Technology, Production Logging, and Ultrasonic Logs - A Case Study

Adesoji Adedamola, Diptaroop Chakraborty, and Ariel Sedlacek, Halliburton; Tshissola Tambwe, Neil Hay, Salomao Dode, Abel Cruz, Jose Rodrigues, Jose Nzau, Adriano Cunha, Olivio Mavuba, and Domingos Andrade, Sonangol

Joint Inversion and Unsupervised Learning Applied to NMR Data Processing That Eliminates the Need for Regularization

Naveen Krishnaraj, Neaqtech; Michael Myers and Lori Hathon, University of Houston; Alon Arad, Automated Analytics

New Iterative Resistivity Modeling Workflow Reduces Uncertainty in the Assessment of Water Saturation in Deeply Invaded Reservoirs

German Merletti, Michael Rabinovich, Salim Al Hajri, William Dawson, and Russell Farmer, BP; Joaquin Ambia and Carlos Torres-Verdín, The University of Texas at Austin

Petrophysical Uncertainty: Regression and Models

Russell Farmer (ADNOC, formerly BP); Anjum Sayed and Behrooz Raeesi, BP



Solving the Challenge of Acquiring Low UCS Cores for Quantitative Digital Rock Physics

Dmitry Lakshtanov, Jennie Cook, Yuliana Zapata, Robin Eve, Mark Lancaster, Nathan Lane, and Glen Gettemy, BP; Ian Draper and Tim Gill, Baker Hughes; Kevan Sincock, Independent (formerly BP); Dave Saucier, BP

Spatial Sensitivity Study Essential to Geosteering Interpretation

Jun Zhu, Yong Die, Yuanshi Tian, Yongyang Song, Shansen Yang, and Ting Yang, China National Logging Corporation; Yanjun Chen and John Zhou, Maxwell Dynamics Inc.

Successful Caprock Stress Testing With a Wireline Straddle Packer Tool Configured With an Innovative Controlled Pressure Bleedoff Design

Olav-Magnar Nes, Egil Romsas Fjeldberg, and Nils-Andre Aarseth, Aker BP; Bob Engelman, Venkat Jambunathan, Michael Evans, and Tony van Zuilekom, Halliburton

Successful Identification of Bypassed Pay Zones and Wet Sands, in a Mature Oil Field, Using Multifrequency Dielectric Logging and Advanced Radial Inversion Methods: A Case Study From Colombia.

David Alfonso Serrano, Doris Patricia Ortiz, Tito Jose Acosta, Heliodoro Canarete, and Daniel Ricardo Cifuentes, Ecopetrol; Amer Hanif, Elton Frost Jr., Fei Le, Luis Laguna, and Milton Mendez, Baker Hughes

Technological Innovations for Hydraulic Fracturing Method for Stress Measurements With Wireline Formation Testers

Pierre-Yves Corre, David Becquet, Richard Jackson, Magdy Samir, Albert Ng, Sammy Haddad, and Ashers Partouche, Schlumberger

Transient Electromagnetic Response of Electrode Excitation and Geometric Factors of Desired Signal

Xiaolin Zhu, Jiacheng Liu, and Jianguo Shen, Tianjin University; Yongjin Shen, Beijing Huahui Test Technology Co.Ltd.

Utilization of Digitalized Numerical Model Derived From Advanced Mud Gas Data for Low Cost, De-Risking Drilling and Effective Completion Plan

Philip Shane Gerard Buckle, Abdul Faiz Haji Abdullah, and Nurhafizah Zaini, Brunei Shell Petroleum; Ivan Fornasier, Aleksandar Gligorijevic, Andrea Di Daniel, Gokarna Khanal, and Sridhar Vignaraja, Schlumberger

A DECADE WITH UDAR TECHNOLOGY: STATUS OF LOOK-AROUND AND LOOK-AHEAD APPLICATIONS AND FUTURE POTENTIAL

A New Generation of LWD Geosteering Electromagnetic Resistivity Tool Providing Multilayered Bed-Boundary Detection, Anisotropy Determination, and Azimuthal Resistivity Measurements for Accurate Well Placement and Formation Evaluation

Hsu-Hsiang (Mark) Wu, Alan Cull, Li Pan, Clint Lozinsky, Matthew Griffing, Yijing Fan, Alban Duriez, and Michael Bittar, Halliburton



An Advanced Ultrahigh-Definition Directional Electromagnetic Propagation Logging Tool for Mapping While Drilling and Multilayered Formation Evaluation

Hui Xie, Keli Sun, Ettore Mirto, Joe Gremillion, Sarwa Tan, Kent Harms, Jianguo Liu, and Yao Feng, Schlumberger

Focusing UDAR Inversion for Navigation in Quasi-Layered Formations

Arvi Cheryauka and Danil Safin, Baker Hughes

Mapping Injection Water Slumping and Reservoir Boundaries Using Real-Time ANN 2D Inversion of Extra-Deep Azimuthal LWD Resistivity Measurements

Firdaus Bin Mohamed Noordin, Ibrahim Abdelgaffar Seddik, Maniesh Singh, Ayesha S. Al Meamari, Sami Abdalla AlSaadi, Saif Al Arfi, and Mariam N. M. Al Baloushi, ADNOC Onshore; Douglas Boyd and Nader Gerges, ADNOC Upstream; Dmitry Kushnir, Gleb Dyatlov, Yuriy Antonov, Asim Mumtaz, and Sanathoi Potshangbam, Baker Hughes

Past, Present, and Future Applications of Ultradeep Directional Resistivity Measurements: A Case History From the Norwegian Continental Shelf

Supriya Sinha, Arthur Walmsley, Nigel Clegg, and Brigido Vicuna, Halliburton; Andrew McGill, Téo Paiva dos Reis, Marianne Therese Nygård, Gunn Åshild Ulfesnes, Monica Vik Constable, Frank Antonsen, and Berit Ensted Danielsen, Equinor

Precise Localization of Offset Wells Crossed With Deep Directional Resistivity Measurements

Michael Thiel, Haifeng Wang, Yong-Hua Chen, Mikhail Zaslavsky, Lin Liang, and Jean-Michel Denichou, Schlumberger; Henning Hoeyland, Brian Gallagher, and Nguyen Xuan Phong, Jadestone Energy; Frank Antonsen, Equinor

Real-Time 3D Anisotropy Analysis Enables Lithology Identification at Distance

Ayman Elkhamry, Saudi Aramco; Ahmed Taher, Eduard Bikchandaev, and Mohamed Fouda, Halliburton

The Impact of Ultradeep Azimuthal Resistivity Technology on ENI Geosteering Workflow Evolution

Maurizio Mele, Filippo Chinellato, Andrea Leone, and Massimiliano Borghi, ENI S.p.A; Gianbattista Tosi and Jorn A.Tveit, Vår Energi AS

The Journey of Reservoir Mapping While Drilling - What We Learned and What We Need for the Future

Nasser Faisal Al-Khalifa, Deepak Joshi, Mohammed Farouk Hassan, and Asheswar Tiwary, Kuwait Oil Company; Ihsan T. Pasaribu, Mahmoud Siam, Salih Noreldin Osman, Chandan J. Keot, and Shady Moustafa Abdelbaset, Schlumberger

UDAR: Past, Present, and Future. An Operator's Experience and Perspective on the Challenges and Opportunities in Applications With Ultradeep Resistivity Tools

John Bergeron, Michael Rabinovich, Murad Murtuzaliyev, Elnur Binyatov, and Andy Ronald, BP

Ultradeep Azimuthal Resistivity Tools Application and Benefits in Brazilian on Shore Scenarios

Paulo Roberto Alves Netto, Antonio Mainieri Vieira da Cunha, Ana Augusta Gonçalves Meira, Marcio Ivan Carvalho Moreira, Gustavo Henrique Schmitt, and Apoena Rossi Barreira, Petrobras S.A.



What Next After a Decade With Significant Advances in the Application of Deep Directional Measurements?

Frank Antonsen, Berit Ensted Danielsen, Kåre Røsvik Jensen, Monica Vik Constable, Maria Emilia Teixeira De Oliveira, Steen Agerlin Petersen, Marta Prymak-Moyle, and Jon Kåre Lotsberg, Equinor ASA

ADVANCES IN THE INTEGRATION OF WELL LOGS AND SURFACE ELECTROMAGNETIC MEASUREMENTS FOR RESERVOIR MONITORING

Subsurface Electromagnetic Frac and Flowback Response to Natural and Induced Fracture Networks

Amanda C. Reynolds, Nabil Eldam, Chris Galle, and Brad Bacon, Encino Energy; Trevor Pugh, Jeffrey Chen, and Suresh Dande, ESG Solutions

AUTOMATION IN BOREHOLE GEOLOGY

Unsupervised Facies Pattern Recognition on Borehole Images of Brazilian Presalt Carbonates Borehole Images

Laura Lima, Nadege Bize-Forest, Giovanna Carneiro, Adna Paz de Vasconcelos, and Patrick Pereira Machado, Schlumberger

DEEP LEARNING WITH HIGH-DIMENSIONAL PETROPHYSICAL DATA

Automatic Fracture Segmentation and Detection From Image Logging Using Mask R-CNN

Yubo Liu, China University of Petroleum, Beijing and CNPC; Guangzhi Liao and LiZhi Xiao, China University of Petroleum, Beijing, Harvard SEAS-CUPB Joint Laboratory on Petroleum Science and CNPC; Jun Zhou and Guojun Li, CNPC and PetroChina Logging Co.; Zhen Liang, Jiawei Zhang, Xinyu Zhang, and Zhe Zhang, China University of Petroleum, Beijing

Machine-Learning Assisted Prediction of Permeability of Tight Sandstones From Mercury Injection Capillary Pressure Tests

Jassem Abbasi, University of Stavanger; Jiuyu Zhao, China University of Petroleum; Sameer Ahmed, University of Stavanger; Jianchao Cai, China University of Petroleum; Pål Østebø Andersen, University of Stavanger

Machine Learning for Determining Remaining Oil Saturation Based On C/O Spectral Logging in Multilayer String Cased Well

Fei Qiu, Feng Zhang, Zhiyuan Liu, Guiping Xiao, and Qunwei Fang, China University Of Petroleum - East China

Multiscale Reservoir Classification Based on Machine Learning

Gang Luo, LiZhi Xiao, GuangZhi Liao, SiHui Luo, and RongBo Shao, China University of Petroleum, Beijing; Jun Zhou and GuoJun Li, PetroChina Logging Co., Ltd.; ShengLuan Hou and JieWen Wu, Huawei Cloud Computing Technologies Co. Ltd

Sequential Multirealization Probabilistic Interpretation of Well Logs and Geological Prediction by a Deep-Learning Method

Sergey Alyaev, Adrian Ambrus, and Nazanin Jahani, NORCE Norwegian Research Centre; Ahmed H. Elsheikh, Heriot-Watt University



Use of Symbolic Regression for Developing Petrophysical Interpretation Models

Songhua Chen, Wei Shao, and Huiwen Sheng, Halliburton; Hyung Kwak, Saudi Aramco

DIGITALIZATION IN PETROPHYSICS: A REVOLUTION IN FORMATION EVALUATION?

Impact of Missing Data on Petrophysical Regression-Based Machine-Learning Model Performance

Andrew McDonald, Lloyd's Register

Norwegian Released Wells Project: Study Design, Material Preparation, Measurements, and Data Analysis

Odd Kolbjørnsen and Erik Hammer, Lundin Energy; Malgorzata Kusak, Norwegian Oil & Gas - NOROG; Peter Wellsbury, Rockwash Geodata; Stefano Pruno, Stratum Reservoir

Permeability Prediction With Integration of Log and Core Data of a South Tanzania Gas Field Using Artificial Intelligence Techniques

Patrick Kabwe, Tanzania Petroleum Development Corporation

Using Digital Rock Physics to Evaluate Novel Percussion Core Quality

Dmitry Lakshtanov, Jennie Cook, Yuliana Zapata, Robin Eve, Mark Lancaster, Nathan Lane, Glen Gettemy, and Dave Saucier, BP; Ian Draper and Tim Gill, Baker Hughes; Kevan Sincock, Independent (formerly BP)

DISTRIBUTED FIBER OPTICS FOR FORMATION EVALUATION

Comparison of Raman, Brillouin, and Rayleigh Distributed Temperature Measurements for High-Rate Wells

Brian C. Seabrook, ExxonMobil; Andreas Ellmauthaler, Michel LeBlanc, Mikko Jaaskelainen, John L. Maida, and Glenn A. Wilson, Halliburton

Development of Comprehensive and Efficient DTS Interpretation Method for Fracture Diagnosis

Dan Hill, Shohei Sakaida, and Ding Zhu, Texas A&M University

Full-Waveform Inversion of Fiber-Optic VSP Data From Deviated Wells

Olga Podgornova, Pierre Bettinelli, Lin Liang, Scott Leaney, and Joel Le Calvez, Schlumberger; Marco Perez, Velvet; Ahmed Soliman, ENI

Joint Well Integrity Survey via a Hybrid Fiber-Optic DAS and DTS Sensing Cable, Multi-Arm Finger Calliper, and Magnetic Thickness Tools

Odum Ebokpo, Silixa Ltd

Locating Microseismic Events and Determining Spatial Uncertainty Using 1C DAS Fiber-Optic Strain Measurements or a Combination of 1C (DAS) and 3C (Geophones)

Joel Le Calvez, Takashi Mizuno, Pierre Bettinelli, and Colin Wilson, Schlumberger

Multiphase Flow Rate Profiling With Uncertainty Through Distributed Temperature Sensing and Pulsed-Neutron Oxygen Activation Modeling in Complex Wells



Marco Pirrone, Giuseppe Galli, and Roberta Marino, Eni S.p.A.

Signal Processing and Machine Learning for Effective Integration of Distributed Fiber-Optic Sensing Data in Production Petrophysics

Alberto Mendoza, Çağrı Cerrahoğlu, Alessandro Delfino, and Martin Sundin, LYTT Limited

NUCLEAR MAGNETIC RESONANCE OF CUTTINGS: MEASUREMENTS AND INTERPRETATION

An Optimized NMR-Based Workflow for Accurate Porosity and Density Measurement of Drill Cuttings

Jinhong Chen, Stacey M. Althaus, and J. David Broyles, Aramco Americas; Mohammed Boudjatit, Saudi Aramco

Corrections and Extensions to the Gri Technique: Dual Imbibition, NMR, and SEM Image Analysis

Clara Palencia, University of Houston

Evaluation of Effectiveness of Core Cleaning Methods

Gabriela Singer, Halliburton; Shouxiang Mark Ma, Saudi Aramco RDD; Wei Shao and Songhua Chen, Halliburton; Harry Xie and Phil Hawley, Core Laboratories

Unconventional Drill Cuttings Analysis Using 23-MHZ 2D NMR

Z. Harry Xie and Omar Reffell, Core Laboratories LP

Validation of Porosity of NMR of Cuttings

Michael Dick, Dragan Veselinovic, Taylor Kenney, and Derrick Green, Green Imaging Technologies

RECENT ADVANCES IN BOREHOLE IMAGE TECHNOLOGY AND INTERPRETATION

Automated Corrosion Analysis With Prior Domain Knowledge-Informed Neural Networks

Salma Benslimane, Josselin Kherroubi, Kamaljeet Singh, Jean-Luc Le Calvez, Thomas Berard, and Mikhail Lemarenko, Schlumberger

Best Image: Deep Learning for Saliency Estimation Using Expert Rankings

Pontus Loviken, Nadege Bize-Forest, and Josselin Kherroubi, Schlumberger

BHI Logs and ML Automated Presalt Carbonate: Texture Recognition and Petrophysical Properties Propagation Using Image Log, Core Images, and Porosity-Permeability From Plugs

Barbara Quediman, Enrique Estrada, Radompon Sungkorn and Jonas Toelke, Halliburton

Bridging the Gap Between Geologists and Drillers: LWD Ultrasonic Imaging Goes That Extra Mile

Nadege Bize-Forest, Arnaud Jarrot, Emmanuel Legendre, Daniel Quesada, Isabelle Le Nir, Chandramani Shrivastava, and Thilo Brill, Schlumberger

Comprehend Complex Clastics: Consistent Real-Time Geological Interpretation With Borehole Imaging Independent of Drilling Fluid and Telemetry Limitations



Mathias Horstmann, Chandramani Shrivastava, and Adrian A., Schlumberger; Beate Aas Bakke, Odd Aasheim, Terje Kollien, and Øyvind Stirø, Lundin Energy

Defining Formation Complexity and Anisotropy With Logging-While-Drilling Dual Ultrasonic Images

Naoki Sakiyama, Matthew Blyth, Hiroaki Yamamoto, Mizuki Sagara, Sarwa Tan, Chandramani Shrivastava, Evgeniya Deger, and Hiroshi Nakajima, Schlumberger; Adam Haecker, Continental Resources; Mark G. Kittridge, Occidental

Fracture Characterization Combining Borehole Acoustic Reflection Imaging and Geomechanical Analyses

Xiao-Ming Tang, China University of Petroleum (East); Pei-Chun Wang, CNOOC; Sheng-Qing Li, China University of Petroleum (East); Lei Xiong, CNOOC; Han-Lin Zhang, China University of Petroleum (East)

Use of Impedivity- and Permittivity-Dominated Images to Identify and Characterize Fractures in Altered Basement Rocks - A Case Study From the Norwegian North Sea

Sayyid Ahmad, Halliburton; Ádám Spitzmüller, Jon Haugestaul, István Nagy-Korodi, and Botond Kemény, MOL Norge AS; Eric Van Beest, Peter Barrett, Venkat Jambunathan, Ahmed Fouda, and Baris Guner, Halliburton

SURFACE LOGGING TECHNOLOGY IN THE ERA OF DIGITALIZATION AND NEW ENERGIES

Decoding Nonproductive and Asphaltene Rich Intervals in Conventional Clastic Reservoirs While Drilling

Maneesh Pisharat, Schlumberger; Rolando di Primio and Øyvind Stirø, Lundin Energy; Yon Blanco, Julian J. Pop, Shahnawaz Molla, Karim Bondabou, Reda Karoum, and Soraya Betancourt, Schlumberger

Key Role of Regearing Mud Gas Logging for Natural Hydrogen Exploration

Dariusz Strapoc and Ivan Fornasier, Schlumberger

Mud-Gas-Data-Based Qualitative to Semi-Quantitative Near-Real-Time Petrophysical Analysis Contributes Crucial Information for Critical Decisions in Real-Time Reservoir Navigation

Nicklas Ritzmann, Svenja Erdmann, Donata Scanavino, and Erik Lehne, Baker Hughes



Real-Time Fluid Identification From Integrating Advanced Mud Gas and Petrophysical Logs

Margarete Kopal, Gulnar Yerkinkyzy, Marianne Therese Nygård, Alexandra Cely, Frode Ungar, Sandrine Donnadieu, and Tao Yang, Equinor ASA

The Case for Advanced Mud Gas Logging Becoming More Routine in Development Drilling; Examples From the Recent Shell HPHT INFILL Campaign in the Central North Sea

Sadat Kolonic, Reema Mohanty, Matt Hale, Mensur Hodzic, Liam Hare, David Jones, Claudius Buerger, and Olaf Podlaha, Shell E&P; Maneesh Pisharat, Schlumberger

Unlocking Large Potentials of Standard Mud Gas for Real-Time Fluid Typing

Tao Yang, Knut Uleberg, Alexandra Cely, and Gulnar Yerkinkyzy, Equinor

THE ROLE OF LONG-TERM PETROPHYSICS IN CARBON CAPTURE, UTILIZATION, AND STORAGE

A Monitoring CO₂ Method by the Dual Cross-Section Pulsed-Neutron Logging Technology in Heavy Oil Reservoirs

Jilin Fan, China Feng Zhang, Lili Tian, Guiping Xiao, Hui Zhang, and Qunwei Fang, China University of Petroleum-East China

CCUS in Mature Fields: How Core-to-Log Data-Driven Analytics Enhances Mechanistic Models for the Purpose of Reservoir and Caprock Mineralogical Characterization

Marco Pirrone, Federica Di Maggio, Dario Reolon, Massimiliano Borghi, and Maurizio Mele, Eni S.p.A.

Characterization of Pulsed-Neutron Responses to Monitor CCUS Projects

Luis Quintero, Weijun Guo, and Robert Gales, Halliburton



Workshops 1-4, Saturday June 11, 2022

WORKSHOP 1:

TITLE: Organic-Rich Shale Formation Evaluation: Making Sense of the Contradictions

Date:	Saturday, June 11, 2022:
Time:	8:00 a.m. – 5:00 p.m.
Fee:	\$500 for registered attendees; \$600 non-registered (includes lunch):
Limit:	Max 40 participants
Location	Share 2 meeting room at Clarion Energy Hotel

Course Summary: This workshop presents fundamentals of organic-rich shale formation evaluation from laboratory core and well logging measurements. The course focuses on learnings from the past decade of research and operations, and highlights continuing misconceptions in shale evaluation. Course content includes a focus on organic geochemistry and source rock analysis, the properties of kerogen and its impact on well logging measurements, recent advances in core retort and crushed rock analysis for fluids quantification, quality control practices for validating the accuracy of laboratory measurements. State-of-the-art approaches for organic shale evaluation from core and logs will be illustrated using data-rich field studies from key economic plays in the USA.

The morning session will focus on fundamentals and properties of organic shales. The afternoon session will focus on application and interpretation of organic shales using log and core data. We will use real-life data to elaborate on best practices in shale analysis and interpretation. Course attendees are encouraged to participate in open discussions through the workshop.

Expectations: Participants will be exposed to various laboratory and well logging techniques applied in organic-rich shale formation evaluation. Participants should expect to learn fundamentals of organic geochemistry, core analysis, and petrophysics pertaining to organic shale evaluation, including how well logging measurements are affected by organic matter. They will be given illustrations on how to evaluate the quality of laboratory and logging measurements, and how accurately interpret organic shale zones in a variety of environments.

Topic Outline:

- Fundamental properties of organic shale, including petrophysical logging responses of organic matter
- Laboratory testing including pyrolysis, higher-frequency NMR 2D mapping, retort, and crushed rock analysis such as GRI and its modified versions
- Key considerations and common mistakes in core evaluations of organic shales
- Use of basic and advanced logging measurements to calculate porosity, saturation, and permeability in organic-rich shales

Who Should Take the Course?

Any geoscientist, petrophysicist, or petroleum engineer with an interest in organic shale petrophysics

Prerequisites

- Basic understanding of logging tool principles; for example, we will not explain how a density tool works
- A basic understanding of mineralogy and lithology; for example, what is a sandstone or limestone
- A basic understanding of oil properties; for example, it is lighter than water generally

Teaching Methods

The course will be in person and there will be focused discussion within the class. Discussion will be off the record to encourage participation. Virtual participation will not be available.

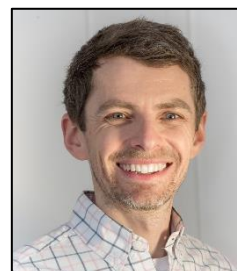
Are handouts provided? Yes, a bound notebook with slides will be provided

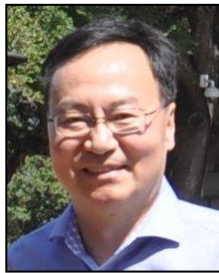
About The Instructors:



Adam Haecker is a Senior Petrophysicist and Supervisor of Petrophysics at Continental Resources in Oklahoma City, OK. Continental Resources is active in Southern Oklahoma, North Dakota, Permian, and Wyoming. He is currently researching a diverse range of topics including resistivity variations in organic shales, machine learning techniques, kerogen vs. maturity relationships, and capillary pressure in ultra-low permeability rock. He is currently the VP of Finance for SPWLA. He previously served on the SPWLA Board from 2018-2020 as North American Director-1. He obtained his B.S. in geology from Texas A&M University in 2007. He co-authored or authored numerous papers on organic shales including Rv/Rh Anisotropy in Unconventional Formations: Resolving the Riddle of Resistivity (2021), Universal curves describing the chemical and physical evolution of type II kerogen during thermal maturation (2020), and Comparison of organic matter correlations in North American shale plays (2016).

Paul Craddock is a geochemist and Senior Research Scientist in the Modeling & Interpretation Department at Schlumberger-Doll Research Center, Boston, MA. His research addresses oilfield petrophysics using nuclear, X-ray, infrared spectroscopy, and most recently machine learning methods. He has developed methods to: derive resistivity-independent saturation from spectroscopy logs; indicate zones for well placement and production in shale (Reservoir Producibility Index, RPI); combine cuttings and logs for enhanced petrophysics in data-poor laterals; optimize kerogen properties for global shale evaluation (TMALI). Paul received a Ph.D. in chemical oceanography from M.I.T. in 2009 and has co-authored 50 journal and conference publications. His paper Thermal maturity-adjusted log interpretation (TMALI) in organic shales was awarded Best Paper at the SPWLA 60th Annual Logging Symposium. Paul is twice a SPWLA Distinguished Speaker (2016-17, 2019-20) and a SPE Distinguished Lecturer (2020-21).





Z. Harry Xie is NMR Senior Advisor at Core Laboratories. He received his PhD in Physics from the University of Kent at Canterbury, UK, in 1994 and worked as a research fellow for both the University of Surrey and the University of Kent on an industrial project to build an on-line NMR system for quality control purposes. Dr. Xie has spent several years working as Product Specialist to develop and support laboratory NMR products (MARAN product line) at Resonance Instruments Ltd., UK. He has also spent time at Bruker as the Senior Applications Scientist in the Time Domain NMR division, Technical Director of the Time Domain NMR products for Asia Pacific, and General Manager of Bruker Optics China. Dr. Xie has been focusing on developing new NMR techniques, permeability models, and petrophysical data processing for unconventional tight rocks such as oil and gas shales since he joined Core Lab in November 2012. He is currently the VP of Information Technology for SPWLA. He is a past-president of the NMR SIG (Special Interest Group) of SPWLA. He was one of the three co-chairs of the 2016 NMR Topical Conference, and was one of the key players in setting up the NMR SIG.

WORKSHOP 2:

TITLE: Machine Learning and Artificial Intelligence Within Petrophysics

Date: Saturday, June 11, 2022:
Time: 8:00 a.m. – 5:00 p.m.
Fee: \$500 for registered attendees; \$600 non-registered (includes lunch):
Limit: Max 40 participants
Location: Share 1 meeting room at Clarion Energy Hotel

Course Summary: This workshop will focus on the applications of Artificial Intelligence (AI) and Machine Learning (ML) to the upstream O&G industry. The workshop will provide an introduction to machine learning, lay out sample workflows and steps for ML applications and summarize some of the used cases in the industry. The workshop will cover both supervised and unsupervised learning and highlight applications such as QA/QC, outlier detection, facies mapping and learning complex functional mapping. Hands-on tutorials with Python codes to analyze a publicly available data set will also be provided.

Expectations: Participants should leave this workshop with a good understanding of workflows to use ML to automate petrophysics workflows

Topic Outline

- Introduction to Machine Learning and AI
- Importance of Data Quality Control for ML
- Unsupervised Learning Algorithms
 - K-Means Clustering
 - DBSCAN
- Unsupervised Learning Applications
 - Outlier Detection
 - Dimensionality Reduction
- Supervised Learning Algorithms

- Neural Networks
- Decision Trees
- Random Forest
- Supervised Learning Applications
 - Permeability Prediction
 - Facies Prediction

Who Should Attend?

Petrophysicists interested in automating workflows

Prerequisites

A basic understanding of coding. Advanced knowledge of logging measurements

Teaching Methods

Lectures and computer labs

Are handouts provided? Yes PDF.

About The Instructors:



Lalitha Venkataramanan is the Reservoir Performance: Data Science Advisor in Schlumberger. She is the recipient of SPWLA 2021 Distinguished Technical Achievement Award. She is also an Associate Editor for NMR-Petrophysics. She is regional distinguished speaker for SPWLA for 2018-19. She is on the board of SIAM and Business-Industry-Government Math network. Her current interests include machine learning, mathematical modeling and inversion, optimization, probability and stochastic processes. Trained as an Electrical Engineer, she obtained her M.S. and Ph.D. degrees from Yale University in 1998. She has co-authored 40+ peer-reviewed publications and has over 24 granted US patents and 18 pending patent applications.

Andy McDonald is a Petrophysicist with Lloyd's Register in Aberdeen, Scotland, and provides domain expert knowledge in petrophysics, machine learning and python programming to the development of IP (Interactive Petrophysics). Prior to joining Lloyd's Register, Andy worked within the geoscience group at Baker Hughes where he was the focal point for borehole acoustic waveform processing and interpretation, as well as petrophysics and well log data quality control. In 2021, he became a distinguished speaker for the SPWLA. He holds an MSc in Earth Science and a BSc (Hons) in Geology & Petroleum Geology. Andy has co-authored several technical papers for SPWLA and SPE conferences covering machine learning, heavy oil, and low salinity waterflooding. He also hosts his own YouTube channel covering applications of python development to petrophysical and geoscience data.



Vikas Jain is currently working in Schlumberger's Analysis and Interpretation business as Principal Petrophysicist and Global Domain Head of Petrophysics and Acoustics, based out of Houston, U.S.A. His focal area is development of custom and intelligent solutions, leveraging machine learning and artificial intelligence, to help solve common upstream challenges. Previously he was managing Interpretation Engineering projects of NMR Answer Products and Next Generation Data-Driven Petrophysics in Schlumberger's Engineering Center in Houston. He



started his career with Schlumberger in 2001 as a field engineer. Since then, he has held positions in operations, sales, marketing, domain and engineering. He has authored more than 35 publications and 15 patent applications/grants.

WORKSHOP 3:

TITLE: Formation Testing

Date:	Saturday, June 11, 2022:
Time:	8:00 a.m. – 5:00 p.m.
Fee:	\$500 for registered attendees; \$600 non-registered (includes lunch):
Limit:	Max 40 participants
Location	Confidence meeting room at Clarion Energy Hotel

About the course:

Wireline Formation Testing has developed beyond the basic applications around pressures and fluid sampling and now forms an important sub-discipline on reducing key uncertainties in development projects.

This workshop aims to provide a series of talks that provide insight into:

- Latest technologies from service companies in the wireline formation testing domain
- Examples from Operating companies on how advanced wireline formation testing applications have helped reduce key rock and fluid property uncertainties for projects

Part of the workshop will be aimed at answering specific problems that are pre-submitted by workshop participants and utilizing the expertise of the leading experts in the field of formation testing to help provide solutions to those problems.

This workshop is aimed at promoting constructive discussions of both existing and emerging technologies that can help reduce uncertainties.

Some of the applications that would be presented and discussed in this workshop include:

- Advanced Formation Fluid Typing and trends
- Geomechanical applications, particularly MicroFRAC operations: Key challenges and technologies to overcome these
- Applications of Wireline Formation Testing in the CCUS Domain
- Dynamic testing: Expanding the envelope of deliverables of Wireline Formation Testing: Extended Wireline Formation Testing PTA (aka MiniDST)
- Integrated Interpretation: The importance of integration with other subsurface discipline and examples

This workshop is aimed at discussing the pros and cons of different techniques and to promote healthy discussion on not just the technical merit of some of the advanced



applications, but ideas on how to handle operational discussions with internal and external stakeholders.

Instructors:

Shyam Ramaswami – Team Lead FEAST, Shell
Adriaan Gisolf – Reservoir Domain Champion, Schlumberger
Thomas Pfeiffer – Senior Petrophysicist, Shell
Sefer Coskun – Baker Hughes
Maria Segnini - Schlumberger

WORKSHOP 4:

TITLE: Steering and mapping with Ultra-Deep Look-Around & Look-Ahead Resistivity: a review of the principles, benefits, and latest innovations for both novel and experienced users

Date:	Saturday, June 11, 2022:
Time:	8:00 a.m. – 5:00 p.m.
Fee:	\$300 for registered attendees; \$300 non-registered (includes lunch):
Limit:	Max 100 participants
Sponsor:	SPWLA SIG Resistivity
Location	Opportunity meeting room at Clarion Energy Hotel

Course Summary: After a decade of learning how ultra-deep azimuthal resistivity (UDAR) systems' benefit well construction and field development, time has come to assess its strengths and limits, and review the current and future states of this technology. This workshop organized by the Standardization of LWD Deep Azimuthal Resistivity Services (SDAR) workgroup provides the fundamentals of UDAR principles and the latest innovations in measurement processing, visualization, and interpretation. Practical cases where this technology drives value in optimized well positioning and formation mapping will be shared before closing with a roundtable discussion, so we collectively assess what needs to come next to enhance reservoir understanding and wellbore placement.

Expectations: Participants should leave this workshop with a good understanding

Topic Outline

- Theory and Principle of Ultra-Deep Azimuthal Resistivity measurements
- The different Resistivity Inversions principles, strength and limits
- Practical use of this technology
- Benefits to subsurface knowledge and field development
- Latest innovations for better well placement and formation mapping

Who Should Attend?



This workshop is primarily aimed for both novel and experienced users of ultra-deep azimuthal resistivity (UDAR), from petrophysicists to the drillers, geologists and completion engineers.

Prerequisites

A basic understanding of: Logging-While Drilling, Electromagnetics and Geosteering.
Advanced knowledge of: Not Applicable

Teaching Methods: Lectures and roundtable discussions

Are handouts provided? Yes (PDF)

Workshop Agenda:

Session 1:

Opening [8:00 – 8:15]

Presenter: Michael Rabinovitch (BP), Franck Antonsen (Equinor), Filippo Chinellato (ENI)

Session 2:

Theory and Principle of Ultra-Deep Azimuthal Resistivity measurements and 1D inversions
[8:15 – 9:15]

Instructor: Michael Rabinovitch

Break: 15 minutes

Session 3:

Latest UDAR technology innovations and added value to field development [9:30 – 11:45]

Duration: 4x 30 minutes, 15 minutes break between 2nd and 3rd presenter

Presenters: Nigel Clegg (Halliburton), David Holbrough (Baker Hughes), Prof. Carlos Torres-Verdin (University of Texas at Austin), 4th presenter TBC (Schlumberger)

Lunch break: 60 minutes

Session 4: North Sea case studies [12:45 – 14:05]

Duration: 4x 20 minutes

Break: 15 minutes

Session 5: Roundtable - Operator needs, vision, workflows, know-how & expertise development to drive the Ultra-Deep & Look-Ahead Resistivity Technology and Solutions [14:20– 15:45]

Duration: 1.5 hours

Moderators: Michael Rabinovitch, Franck Antonsen, Filippo Chinellato

Closing

Duration: 15 minutes

Presenters: Michael Rabinovitch, Franck Antonsen, Filippo Chinellato

About The Instructors:

Dr. Frank Antonsen is a specialist in petrophysics in Equinor. He has more than 20 years of experience from the oil industry with focus on R&D activities within petrophysics. NMR logging and core analysis were the main activities the first years in Equinor. Applications of ultra-deep azimuthal resistivity technologies (UDAR) has been his main research topic since 2007. Key activities have been UDAR look-ahead development and interpretation, and workflows for doing pre- and post-job evaluations of high angle wells using UDAR. Today, the main focus is to use the UDAR-experience to improve real-time workflows for geosteering and Geostopping.

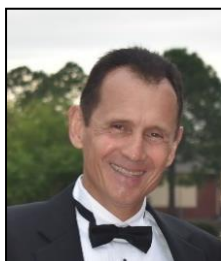


Filippo Chinellato holds a MSc degree in geology from Università di Padova, Italy. Filippo started as MLW/LWD field engineer in 2006 and has been Geosteering since 2007. Currently he is a part of Advanced Well Characterization Department in ENI HQ, focusing also on Geosteering operations and R&D activities.



Dr. Nigel Clegg is the well placement subject matter expert and ultra-deep resistivity product champion for Halliburton. Clegg began working with Sperry Drilling (now Halliburton) in 1996 as an SDL field engineer in Norway, followed by working as a field service coordinator. Later, Clegg began working in geosteering, leading the Scandinavia geosteering team and supporting global operations. Clegg assumed his present role in January 2017, holding an Honours BSc degree in environmental sciences with a geology major and a PhD degree in geology from the University of East Anglia (Norwich). Clegg is a distinguished speaker for SPWLA.

David Holbrough holds a BSc in Geology from the University of Exeter and has over 32 years of industry experience with Baker Hughes. David has spent the majority of his career in operational roles focusing on top-tier reservoir navigation across all major basins. From 2015 to 2020, he led the real-time advisory business in Europe. David is a leader of cross-functional teams directing future curriculum, software, and technology developments within the sphere of reservoir navigation.



Dr. Michael Rabinovitch is a Resistivity Specialist at BP Central New Well Delivery team responsible for monitoring, evaluation and application of EM tools and interpretation technologies for Formation Evaluation and Geosteering. Before joining BP in 2012, he was with Baker Hughes for 18 years as a scientist, Sr. Manager of Computational Physics group, and later as Deputy Director of Research of Drilling and Evaluation. He received his MSc degree in 1983 from the Moscow Institute of Oil and Gas industry and his PhD degree in 1989 from the Russian Academy of Science, both in Geophysics. He is an author/coauthor of more than 100 publications and 44 patents.

Dr. Carlos Torres-Verdín received a B.Sc. degree in Engineering Geophysics from the National Polytechnic Institute of Mexico, a M.Sc. degree in Electrical Engineering from the University of Texas at Austin, and a Ph.D. degree in Engineering Geoscience from the University of California at Berkeley in 1991. During 1991-1997, he held the position of Research Scientist with Schlumberger-Doll Research. From 1997-1999, he was Reservoir Specialist and Technology Champion with YPF (Buenos Aires, Argentina). Since 1999, he has been affiliated with the Department of Petroleum and Geosystems Engineering of the University of Texas at Austin, where he is currently Full Professor, holds the Brian James Jennings Memorial Endowed Chair in Petroleum and Geosystems Engineering, and conducts research on borehole geophysics, formation evaluation, petrophysics, well logging, and integrated reservoir description. Dr. Torres-Verdín is the founder and director of the Research Consortium on Formation Evaluation at the University of Texas at Austin, which has been in operation for 21 years and is currently sponsored by 20 companies. He has published over 230 refereed journal papers and over 230 conference papers, and is author of 6 patents, has served as Guest Editor for Radio Science, invited Associate Editor for Interpretation (SEG), Associate Editor for the Journal of Electromagnetic Waves and Applications, SPE Journal, and Petrophysics (SPWLA), and chair of the editorial board of The Leading Edge (SEG), and is currently Assistant Editor for Geophysics. Dr. Torres-Verdín is recipient of the 2020 Virgil Kauffman Gold Medal from the SEG, 2019 Anthony Lucas Gold Medal from the SPE, 2017 Conrad Schlumberger Award from the EAGE, 2014 Gold Medal for Technical Achievement from the SPWLA, 2008 Formation Evaluation Award from the SPE, 2006 Distinguished Technical Achievement Award from the SPWLA, Distinguished Member of the SPE, and Honorary Member of the SEG. He also received the 2003, 2004, 2006, and 2007 Best Paper Awards in Petrophysics by the SPWLA, the 2006 and 2014 Best Presentation Awards and the 2007 Best Poster Award by the SPWLA, and was designated Distinguished Technical Speaker during 2006-2007 and 2013-2014 by the SPWLA. Dr. Torres-Verdín has supervised 34 PhD and 46 Master's students, conducted numerous industry training courses, co-chaired several technical workshops and conference sessions, and has served as member of multiple SPE, SPWLA, and SEG committees in the past. The internet link <http://sites.utexas.edu/carlostorresverdin/> provides a historical and detailed record of the publication, technical projects, training courses, and research projects undertaken by Dr. Torres-Verdín.



Workshops 5-8, Sunday June 12, 2022

WORKSHOP 5:

TITLE: Symposium Core Viewing Workshop - Norwegian Continental Shelf a Geological and Petrophysical Interpretation Challenge

Date: Sunday, June 12, 2022:
Time: 9:00 a.m. – 4:30 p.m.
Fee: \$500 for registered attendees; \$600 non-registered (includes lunch):
Limit: 45+ persons, divided in rotating subgroups of 10 to 15 persons:
Location: Core Viewing at Stratum Reservoir: Nikkelveien 13, 4313 Sandnes
Transportation: Shuttle busses leaving Clarion Hotel Energy at 9.00 a.m., Sun, 12 June and return to hotel after the workshop

About the course:

The core workshops is facilitated by Stratum Reservoir and co-hosted with AkerBP, Equinor and Lundin Energy experts. It focuses on data integration and upscaling from core to log, including digitalization of cores, all supported with case studies.

After a short ~15min bus ride to the Stratum facilities in Sandnes we will have with a welcome drink the participants registration and a short safety introduction, to the kickoff this unique day.

The delegates will be parted in groups of 10-15 persons which will rotate through the dedicated core viewing rooms made available by Aker BP, Equinor & Lundin. In these smaller groups, there will be ample possibilities to make one's own observations, discuss and interact. On all three core stations, operator experts (petrophysicists, geologist/sedimentologists and geophysicists) will be present to help and to guide group discussion after the initial analyzation by the participants. The operator's interpretation will also be presented.

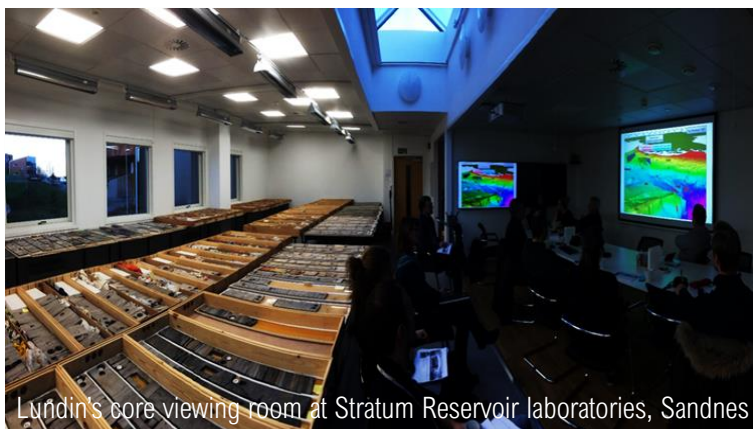
It is your opportunity to study excellent cores taken recently by key operators on the Norwegian Shelf – and listen to demonstrations and firsthand background information on why the cores were taken and their value in petrophysical evaluations.



Equinor's core viewing room at Stratum Reservoir laboratories, Sandnes

Lundin Energy Norway contributes with a Geological and Petrophysical Evaluation of Volcanic/ Metamorphic Fractured Basement, basically closing the loop to the Bømlo field trip of SPWLA 2022.

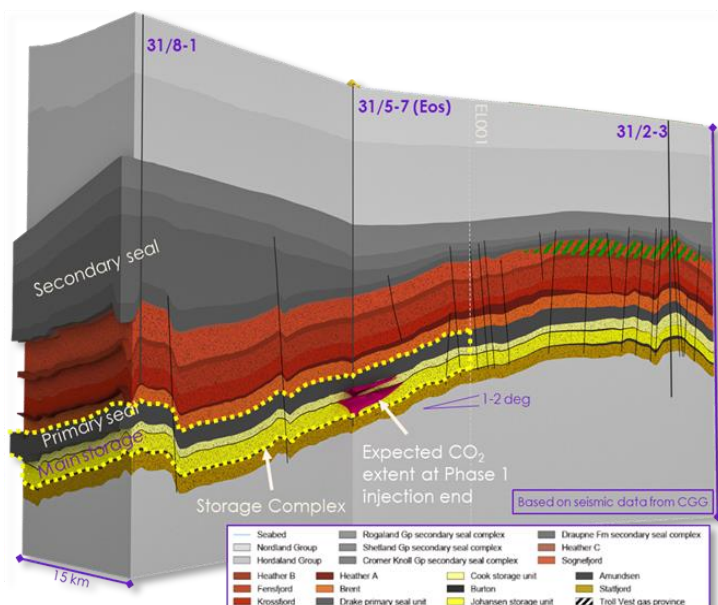
The core theme is on fractured and weathered basement, along with the petrophysical properties and geological relationships with the overlying sediments. Core examples from the Utsira High complex will be present, including the Edward Grieg Field along with Rolvsnes and Solveig Development examples. It is further supported by data of an exploration well in the area. The unique part is the direct comparison with Bømlo outcrop analogues you should have visited the day before by participating in the field trip. So the ones who got out into the field to see and touch, and then informally discuss these outcrop analogues at Bømlo now with cores cut in live wells.



Lundin's core viewing room at Stratum Reservoir laboratories, Sandnes

Instructors:

Equinor will provide their Core and Log based Petrophysical Evaluation of a well from the Northern Light CCUS (Carbon Capture and Underground Storage) project; the relevant well for the workshop was logged over the cored interval with an advanced triple combo including spectral tools, high-definition borehole images, and NMR well logs. Geoscience experts of Equinor will be present at the workshop the interpretation of this relevant well of the flagship CCUS project.



About The Instructors:



Renata Meneguolo holds a M.Sc. degree and a Ph.D. from the University of Padua, Italy, focused on both clastic and carbonate deposits. She has been working in Statoil (now Equinor) both as explorationist and reservoir geologist (notably for the Johan Sverdrup field). Since 2017 she has been principal geologist in the Northern Lights Carbon Capture and Storage (CCS) project in Equinor.

Christian Erik Halvorsen holds a M.Sc. degree in physics from the University of Bergen. He has been working in Statoil (now Equinor) since 1986, starting in the production laboratory doing petrophysical SCAL. In 1994 he moved to petrophysics where he worked for NCS production assets for 15 years before moving to an advisor role working quality assurance and special projects.



AkerBP will unify in a case study the Petrophysics of the Greater Alvheim Area. The core workshop will illustrate how the log and core data in the Greater Alvheim area turbidites (stretching from the Vilje field in the north to the Bøyla and Caterpillar fields in the south, including the prolific Alvheim field and the upcoming Gekko field) were integrated to create a unified petrophysical model. It further presents a case study on the application of this model to build the static and dynamic models for the East Kameleon structure, focusing on the history match and potential infill drilling prospects.

About The Instructors:

Rodmar Ravnås is Principal Advisor in Geology at Aker BP. His technical background is in sedimentology and basin analysis, and has held various positions including Explorationist, Production/Development Geologist, Sedimentology Specialist/Lead Sedimentologist, Special Advisor Reservoir Characterization and Chief Geologists in Norsk Hydro, Conoco and Shell in addition to Aker BP. His academic career includes Research Assistant and Associate Professor in sedimentology/sequence stratigraphy positions at Bergen and Stavanger universities, respectively.

Kristoffer Birkeland is Manager Petrophysics team in AkerBP. Petrophysical background from core analysis and well log interpretation. Previous manager of Stratum petrophysical SCAL laboratory. Held petrophysical positions in ConocoPhillips and OMV, primarily focusing on reservoir characterization and integration of log, core and fluid data for reservoir model builds.



Amitabha Chatterjee is a lead petrophysicist at AkerBP. Coming from many years at Schlumberger prior to joining AkerBP, he provides a logging background to the core-log integration project.

WORKSHOP 6:



TITLE: The importance of Petrophysics in Resources and Reserves Estimation

Date: Sunday, June 12, 2022:
Time: 8:00 a.m. – 5:00 p.m.
Fee: \$500 for registered attendees; \$600 non-registered (includes lunch):
Limit: Max 40 participants
Location: Share 2 meeting room at Clarion Energy Hotel

Course summary:

The SPWLA- RESERVES SIG wishes to invite all petrophysicists, log and core analysts, to a one day workshop covering this very important subject which is critical to our industry. Resources and Reserves estimation is an essential task in the our industry for internal resources accounting, financial transaction and regulatory reporting at least. To ensure consistency, transparency and reliability, several entities have developed guidelines. While the Petroleum Resources Management System by SPE, AAPG WPC, SPEE, SEG, EAGE and SPWLA is becoming an industry wide standard different guidelines tied to different countries and stock exchanges exist. So with this background, what is the role of Petrophysics in resources and reserves assessment? Also what are fit for purpose guidelines (emphasis on guidelines, not rules) are reasonable and necessary.

Expectations: The participants will understanding the key role that petrophysics play in reserves estimation, and ultimately in asset value

Topic Outline

Join us in the workshop to discuss following topics:

- Overview of Petroleum Resources Management System and other guidelines
- The role of Petrophysics in resources and reserves estimation
- Net Pay
 - a. Definition
 - b. Evaluation & Integration methods
 - c. Guideline for input to resources and reserves evaluation

Who Should Attend?

All practicing petrophysicists, log analysts, reserves estimators.

Prerequisites

A basic understanding of open hole logging. Advanced knowledge of field development planning and regulations is advisable, but not essential.

Leaching Methods: Lecture

Are handouts provided? Yes PDF

About The Instructors:



Dr. Luis Fernando Quintero began his oil career in the oil fields of India in 1994. Since then, he has worked as a petrophysicist, reservoir engineer, asset evaluation leader, production manager, financial analyst, and reserves auditor. He has worked in Venezuela, India, USA, Georgia, Azerbaijan, Russia, Ukraine, Greece, Indonesia, United Arab Emirates, Colombia and the United Kingdom.

Dr. Quintero started in the SPWLA in 1993 with the reactivation of the Venezuelan chapter. He was a member of the Technology Committee 1997-2005; director for Europe, 2002; vice president of finance, 2005; in 2014, vice-president of technology and in 2015, elected president of the SPWLA worldwide. He has chaired talks at conferences in Japan, Australia, Norway, Colombia, Mexico, Australia, Scotland, Abu Dhabi, USA and Canada.

Luis's has been qualified to perform reserves reports, and audit reports for private companies in USA, and for public companies traded in the Toronto Stock Exchange, the Australian Stock Exchange, and for Petrosa, in South Africa.

He has also had the opportunity to be the keynote speaker and give his perspective of the oil industry for TV in India, Colombia, London, Houston, Japan, Nigeria, Azerbaijan and Saudi Arabia. He has written about energy policy in the World Energy Monthly Review.

Luis Fernando Quintero holds an Electronic Engineer from Universidad Simón Bolívar - Venezuela, with a Master's and Doctorate in Petroleum Engineering from Louisiana State University - USA; He has 14 patents and more than 35 technical publications.

SPWLA Hydrocarbon Reserves Workshop - SIG Vice-President



Javier Miranda is a Senior Petrophysicist for DeGolyer and MacNaughton, a leading independent consulting firm since 1936. He works in different world-class projects related to reserves and reservoir studies around the globe. Javier has more than 23 years of industrial experience as a Petrophysicist. He started his career in PDVSA where he worked in operations, data acquisition and reservoir studies for 13 years. Then Mr. Miranda moved to BP America Inc. where he worked for five years in Gulf of Mexico projects as reservoir description and operations

petrophysicist.

Javier earned a BSc from Universidad del Zulia and a MSc from the University of Texas at Austin, both in Petroleum Engineering. He also holds a Diploma in Integrated Petrophysics from the former PDVSA School of Petrophysics. On the academia, he served as Adjunct Professor and Lecturer for Formation Evaluation and Graduate Research Assistant. Javier is an active member of SPWLA, SPE, AAPG, SEG and HGS.

He is the current President for the SPWLA Houston Chapter. Mr. Miranda is also VP of the SPWLA Hydrocarbon Reserves SIG and part of the technical committee for SPWLA Symposium 2022. He is co-founder of the SPWLA YP global group where he serves as editor for the SPWLA Today Newsletter. Mr. Miranda received the SPWLA Meritorious Service Award in 2021. Besides, Javier is past SPWLA and SPE officer in other chapters in USA and Venezuela as well as committee member for past symposiums.



WORKSHOP 7:

TITLE: Subsurface Sequestration and Storage of Nuclear Waste and Carbon Dioxide (SAFE- Store Away ForEver)

Instructors:

Date:	Sunday, June 12, 2022:
Time:	8:00 a.m. – 5:00 p.m.
Fee:	\$500 for registered attendees; \$600 non-registered (includes lunch):
Limit:	Max 40 participants
Location	Confidence meeting room at Clarion Energy Hotel

Course Summary: “Nuclear waste and carbon are similar in their aspects of needing to be stored away forever. However, they differ in the way the product gets there. Sequestration of CO₂ relies on the same pore space physics and is kept in place by the same sealing mechanisms that have been explored hydrocarbon extraction has explored and characterized in the hydrocarbon extraction for many years. For nuclear waste, containers will be emplaced in engineered facilities (or boreholes) in a non-porous and impermeable host rock, extending homogeneously roughly 200m around the container with all the associated complexity and special geomechanical considerations required.

In this workshop, we will explore, through case studies and examples, the concepts of underground storage and sequestration. We look at what is required in terms of the planning and regulatory hurdles before the product gets underground, the measurements and recordings required to make sure it stays there and monitoring and verification after the fact to see how it stays underground. Throughout, we will discuss the role of the petrophysicist in all aspects of these large-scale projects.”

Expectations: Participants will be introduced to the concepts and considerations behind sequestration and storage of carbon dioxide and nuclear waste, and the petrophysical considerations for selection of storage sites, including how well logging measurements and interpretation can be applied to determine the desired petrophysical properties.

Participants should leave this workshop with a good understanding of the problems that both methods are trying to solve. They will receive an overview of the major market players and will understand the petrophysical data requirements, first and foremost, the required accuracy of the data and their analyses to meet the specified safety standards. Case studies will show the current level of development among the authorities and industry.

Topic Outline

Part 1 CCS:

- Basic technical foundation: Volumes, Sources, Impact.
- How to assess long-term safety and public opinion.
- Case studies of existing CCS sites and systems
- Special pore-space petrophysics and seal evaluation. Stress path evaluation.
- Special logging and core sampling/analysis techniques.
- Similarities and differences to oilfield technology
- Monitoring systems
- Long Term Well-Integrity for monitoring and disposal wells

Part 2: Nuclear waste disposal:

- Basic technical foundation: Source, Volume, timespans
- How to assess the long-term safety and public opinion.
- Whole rock Petrophysics: Assessment of impermeability and heat sensitivity, fluid flow
- Special geomechanics requirements for engineered disposal system
- Special logging and sampling techniques: pressurized coring
- Similarities and differences to the mining industry, including logging subsurface wells.
- Alternative Disposal Methods: Boreholes.
- Host rock comparison and specific volume requirements.
- Mitigating public fear through quantification of petrotechnical data – a dream?

Who Should Attend?

Any geoscientist, petrophysicist, or petroleum engineer with an interest in subsurface storage and sequestration.

Prerequisites

- Basic understanding of logging tool principles and physics of their measurements.
- Basic understanding of routine and special core analyses.
- Basic understanding of mineralogy and lithology.
- An interest in application of petrophysical concepts to non-traditional subsurface applications

Teaching Methods

The course will be taught in person and through lectures and discussions within break-out teams and with the larger group. Discussions will be off the record to encourage participation. Virtual participation will not be available.

Are handouts provided? Yes, PDF's will be distributed to all participants.

About The Instructors:



Katy Larson specializes in subsurface characterization and operations for fields on injection–water flood, steam flood, and gas injection with a current focus on carbon sequestration into saline reservoirs across the United States. Her expertise in regulatory and operations led her to her current role at Battelle Memorial Institute as a Carbon Sequestration Commercial Project Manager. Prior to Battelle, Katy was a Petrophysicist at California Resources Corporation (formally Occidental Petroleum). She also held positions at Stone Energy as a New Ventures Geologist and Schlumberger WesternGeco as a Seismic Processing Geophysicist. Katy earned a Master of Science in Geology from the University of Louisiana at Lafayette and a Bachelor of Science in Geology from Louisiana State University. She currently serves as SPWLA President for the Bakersfield, California Chapter.

Dr. Rodney Garrard is a geologist with over 19 years' international experience in the oil and gas industry. Past duties include Wellsite and Operations Geology at Wintershall and VNG (Neptune Energy), Det Norsk, Tullow Energy, and presently working as Project Manager (Logging and Testing) for the Nationale Genossenschaft für die Lagerung radioaktiver Abfälle (NAGRA) exploration project in Switzerland.



Joachim Strobel has over 35 years of international experience in the oilfield and other geotechnical areas, currently working as a petrophysicist with the German company BGE. This organisation operates three nuclear repositories and explores a new one. He actively defines and executes borehole petrophysics to classify salt-rock as a host for nuclear waste and performed similar shale and basement characterisations in the past.

Joachim started a project to sequestrate a lignite power plant's CO₂, concentrating on volumes and capillary pressures. Early in his career, he recalibrated logging sensors for analysing South Africa's uranium deposits, followed by various positions in the service and oil & gas industry, introducing new logging sensors and building Formation Evaluation groups.

WORKSHOP 8:

TITLE: Introduction to Borehole Image Analysis

Date:	Sunday, June 12, 2022:
Time:	8:00 a.m. – 5:00 p.m.
Fee:	\$500 for registered attendees; \$600 non-registered (includes lunch):
Limit:	Max 40 participants
Location	Share 1 meeting room at Clarion Energy Hotel

Course Summary: This workshop is designed to give an introduction to the functionality of borehole image log data. Participants will acquire knowledge on how to use this data for the description of stratigraphic and structural features as well in-situ stress related features in vertical and horizontal wells. The workshop will describe the acquisition of data, QC and most common pitfalls and will discuss real life examples from the field.

Expectations: Participants should leave this workshop with a good understanding about the functionality and analysis of borehole image log data.

Topic Outline

- Welcome + previous BHI experiences in the group
- What are BHI's (types, muds, WL/LWD)
- BHI interpretation potentials and which BHI is best to deliver answers for a given question
- Acquisition

- QC
- Feature detection
- BHI application in HA/HZ wells.
- Pitfalls vertical wells vs horizontal wells vs LWD
- Attendees present/discuss some of their exercises

Who Should Attend?

This workshop is primarily aimed for Petrophysicists, geologists, geophysicists, and team members involved in reservoir characterization.

Prerequisites: A basic understanding of geology, petrophysics and geomechanics

Teaching Methods

Lectures and computer labs?? As this is a 1day workshop only, no workstations will be available for the participants. However, we will discuss examples from lecturer and participants.

Are handouts provided? Yes PDF

About the instructors



Bernd Ruehlicke is president of Eriksfiord Inc., part of the Eriksfiord group. Bernd worked at Z&S Geologi, PGS and Landmark, where he built image interpretation modules in RECALL and build the interface between PetroBank and RECALL. Bernd is the domain expert for image logs and geomechanics in the Eriksfiord group. He holds a BS in Computer Science and MS in Mathematics from Aarhus University in Denmark and an MBA from the University of Houston. Apart from hiking in nature, he likes Eigenvectors and prime numbers....

Bastian Roters is Co-Founder and Senior Geologist at NiMBUC Geoscience in Vienna. He came into contact with Borehole Images when joining Fronterra Geoscience in 2008. Before, he graduated with a master's degree in Geology from the Technical University Clausthal and worked in research with DSDP and ODP cores at Marum, University of Bremen. At NiMBUC Geoscience he deals with sedimentological interpretation of BHI, geothermal and storage wells and project management.



Susana Gutierrez Carrilero earned her Master's Degree in Civil Engineering from Politechnical University of Catalonia based in Barcelona, Spain. Having 17 years of experience with Halliburton Sperry Drilling, she has been an LWD engineer in West Africa, a geosteering specialist in the USA, Mexico, and Europe, a Principal LWD Technical Advisor in Denver, CO and currently serves as Global Product Champion for LWD Imaging. Prior to her time with Halliburton, Susana worked as an LWD Engineer in Norway and West Africa for Schlumberger.



Shim Yen Han (Yenny) is a Principal Petrophysicist, working as a Measurement Domain Champion supporting LWD business in Southeast Asia. She joined Schlumberger after graduated from University Technology of Malaysia with a Bachelor degree in Petroleum Engineering. She has 26 years of experience in the oil & gas industry started as drilling engineer, moved to the field as LWD engineer, continued as well placement engineer and later began supporting LWD operation and interpretation in China, Japan, North America and South East Asia.



Chandramani Shrivastava is Geology Advisor for Schlumberger Well Construction, based out of its HQ at Sugar Land, TX. He holds M.Tech in Applied Geology from IIT-Roorkee (India) and MS in Petroleum Engineering from Heriot Watt University (UK). He has worked in India, Middle East, South East Asia, West Africa, and US in various technical profiles dealing with well logs. His 20 years of industry-experience include borehole imaging technology development on wireline and LWD, and processing & interpretation. Currently he is working on developing geology while drilling automation workflows with LWD images and surface logging measurements.

Field Trip

TITLE: One Day Field Trip To Norway's First Granite Reservoir Analogue At Bømlo

Field trip leaders: Dr. Eivind Bastesen, Structural Geologist, NORCE
Terje Kollien, Chief Petrophysicist, Lundin Energy
Jan Erik Lie, Chief Geophysicist, Lundin Energy

Date: Saturday, June 11, 2022:
Time: 8:30 a.m. – 6:00 p.m.
Fee: \$300 for registered attendees; \$400 non-registered
Limit:
Location: Bømlo, Norway
Included: Transportation, picnic/lunch, field guide. Pick-up and return from Clarion Energy Hotel
Sponsor: Lundin Energy



About the field trip:

SPWLA is delighted to invite you to our one-day field trip to the weathered granite reservoir analogue in the Bømlo area North of Stavanger. A coach buss will leave from the Clarion Energy at 8.30 am Saturday the 11th of June and expected to arrive back at the hotel around 6 pm the same day.

Dr Eivind Bastesen, a structural geologist will be the main guide in the Bømlo field laboratory and outcrops. He is supported by Jan Erik Lie, Chief Geophysicist and Terje Kollien, Chief Petrophysicist both with Lundin Energy, generously sponsoring this educational trip. They will contribute to set the Bømlo analogue into the Rolvsnes/Haugland High reservoir context from a geophysical, petrophysical and production perspective.



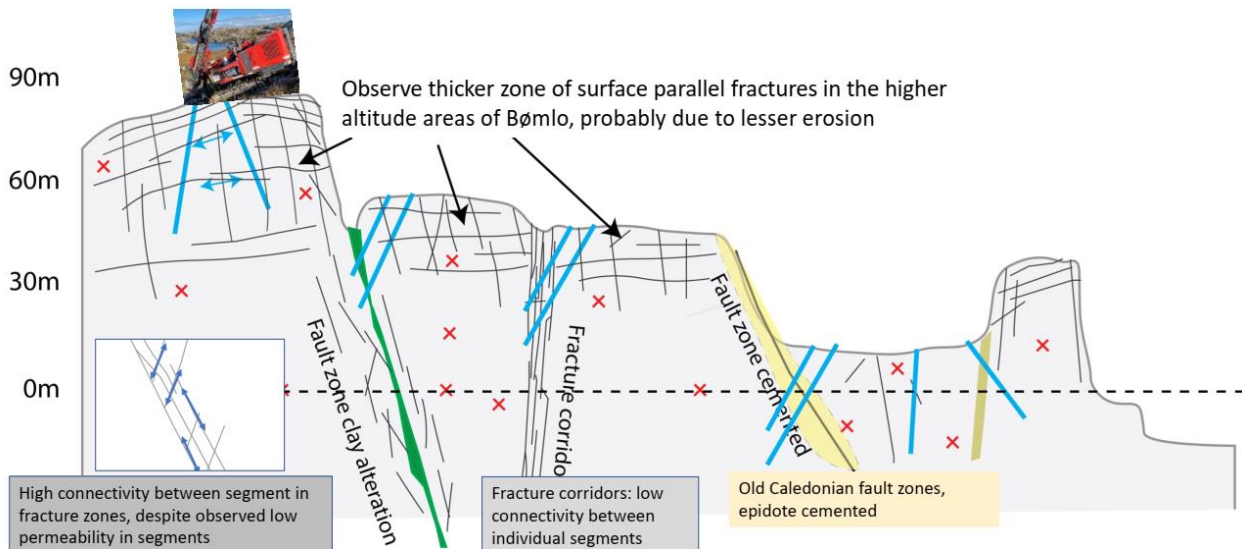
Eivind is a structural geologist specialized within deformation in crystalline basement carbonate lithologies. He has a PhD from university of Bergen 2010 with focus on hydraulic properties of fault zones in carbonate rocks. He joined Uni Research (later NORCE Norwegian Research Center) in 2010 and has led and participated several research projects focusing on flow properties of fractures and faults in analogue reservoirs. Together with Lundin Energy he developed an experimental field laboratory in Bømlo (2019-), to investigate flow properties in fractured and weathered granites. Apart from petroleum research Eivind has worked extensively with geothermal reservoir characterization in Norway and abroad. In 2021 he joined Ruden AS, to develop new concepts of utilizing fractures as storage for heat in the underground.

Course Description

To understand the challenges of mapping and studying fluid flow in faulted and fractured basement rocks, the Bømlo area in the southwestern part of Vestland county, Norway offers an unique analogue to the explored and producing fields on the Utsira high (Lundin Energy and partners).



We will visit several outcrops displaying fault, fracture systems and deeply weathered zones. In the area, several wells and well parks have been established to study the dynamic reservoir properties of fractured and weathered basement rocks. In outcrops you can observe high permeable vertical and surface parallel fractures, while there is generally low, or no permeability measured in large tectonic fault zones due to presence of clay alteration and closed fractures.





SOCIETY FUNCTIONS/SOCIAL EVENTS

STUDENT PAPER COMPETITION

Date: Sunday, June 12, 2022

Time: 8:00 a.m. - 5:00 p.m.

Location: Opportunity meeting room at Clarion Energy Hotel

This event will allow students competing to engage with colleagues from other schools and industry professionals. We hope both graduate and undergraduate students will share their work and research for the opportunity of being awarded “best paper presentation”. The competition will be in held three groups: Bachelor, MSc and PhD.

SPWLA ANNUAL BUSINESS MEETING AND LUNCH

Date: Monday, June 13, 2022

Time: 11:45 a.m. - 1:00 p.m.

Location: Lounge/restaurant at Clarion Energy Hotel

Fee: \$0.00

The SPWLA Annual Business Meeting is a lunch meeting open to all delegate attendees. During the lunch the 2021-2022 President and Board Members will share their accomplishments made during their tenure. Followed by the introduction and welcoming of the 2022-2023 President and Board Members.

SPWLA AWARDS PRESENTATION AND LUNCH

Date: Tuesday, June 14, 2022

Time: 11:45 a.m. - 1:00 p.m.

Location: Lounge/restaurant at Clarion Energy Hotel

Fee: \$0.00

The SPWLA Annual Awards luncheon is open to all delegates, their spouses and guests. During the lunch, individuals will be honored and rewarded for their out-standing achievements and contributions to the Society and industry.

SPWLA LEADERSHIP LUNCHEON*

Date: Wednesday, June 15, 2022

Time: 11:45 a.m. - 1:00 p.m.

Location: Opportunity meeting room at Clarion Energy Hotel

All current SPWLA Chapter Presidents (outgoing and incoming), all Past SPWLA Presidents an SIG coordinators are invited to a complimentary luncheon.

**BY INVITATION ONLY*



ICEBREAKER RECEPTION

Date: Sunday, June 12, 2022

Time: 6:30 p.m. – 8:00 p.m.

Fee: Complimentary

HALLIBURTON

PLACE:

Sponsored by Halliburton

Registered guest of the symposium are invited for the Sunday evening icebreaker reception. This will be a great opportunity meeting up with old acquaintances or making new contacts while celebrating the opening of the symposium!

MONDAY EVENING SOCIAL

Date: Monday, June 13, 2022

Time: 6:30 p.m. – 8:00 p.m.

Fee: Complimentary

Baker Hughes 

PLACE:

Sponsored by Baker Hughes

Registered guest of the symposium are invited for the Monday evening social. This will be a great opportunity to meet up with old acquaintances or making new contacts while attending the symposium!

TUESDAY EVENING SOCIAL

Date: Tuesday, June 14, 2022

Time: 6:30 p.m. – 8:00 p.m.

Fee: Complimentary

Schlumberger

PLACE:

Sponsored by Schlumberger

Registered guest of the symposium are invited for the Tuesday evening social. Another great opportunity for meeting up with old acquaintances or making new contacts while attending the symposium!

Partner/Guest Program

Hospitality Suite

Date: Monday - Wednesday

Time 7:30 a.m. - 5:00 p.m.

Place: TBA

Fee: \$100.00

If you're looking for a place to catch up with old friends, visit the Hospitality Suite for refreshments and companionship. The suite will be open to registered accompanying spouses, family members and guests of conference attendees.

Tours

Monday: City Walk - Lunch at Flor&Fjære

Date: June 13, 2022

Time 10:00 a.m. - 5:00 p.m.

Place: departure form and return to Clarion Hotel Energy

Fee: \$190

Included: Bus to/from Stavanger centrum; Local English speaking guide; Boat trip to/from Flor&Fjære; Guided tour of the garden; Three-course lunch meal.

Description



Join a local city expert through fascinating stories that will submerge you into Stavangers diverse history.

Follow one of our handpicked locals, who will share their love for the city with you. Discover Stavanger's many hidden gems and get in touch with the real feel of the city.

Stavanger has so many beautiful spots to best discover on foot. You will be charmed by the city's old town, its cobblestone streets and small wooden houses. Your stroll through Stavanger continues to the market square

at the head of the harbor bay and the 12th century Stavanger Cathedral forming an impressive backdrop.

Looking towards the harbor is the statue of the former mayor and well-known writer, **Alexander Kielland**. The pedestrian street leads you to the **Valberg Tower**, situated on a small hill and overlooking the central part of the city and harbor. Not to forget the popular "Fargegata" - the colorful street and a must to experience for every visitor to Stavanger.

A visit to Flor&Fjære begins with a pleasant boat trip to the island Nord-Hidle outside Stavanger. Upon arrival to the island, the guides are ready to show you the beauty of the gardens, before lunch is served in the jungle.

We won't spoil the story about the history of this unique place, we leave this to the guides.



Tuesday: Lysefjorden - Mountains - Roundtrip

Date: June 14, 2022

Time: 8:30 a.m. – 5:00 p.m.

Place: departure form and return to Clarion Hotel Energy

Fee: \$250

Included: Boat trip along Lysefjorden; Bus and guided tour through the mountains; Lunch at Ørneredet; Stop at Kvæven Folkmuseum; Coffee and sweets at Byrkjedal.

Max number of participants: 16

Description



Experience the beautiful **Lysefjorden** by boat – this trip will take you through the 42 km long fjord with steep mountains formed by massive glaciers. Lysefjorden is one of Norway's longest fjords and the most distinctive fjord in Rogaland. We will pass **Preikestolen, Kjerag, Flørli** and you will be able to see mighty mountains, waterfalls and secluded farms.

At the end of Lysefjorden, a bus will take you through a number of hairpins up to the mountains. On top of the hairpin road, you will enjoy lunch at a restaurant with a magnificent view – **Eagle's Nest** (Ørneredet).

After lunch you will continue your journey in the mountains and drive down the valley of **Sirdal**. With more than 3000 cabins and holiday homes Sirdal is a popular place for skiing in the Winter and hiking in the Summer. A stop at Sirdal Mountain

Museum in Kvæven is planned where you will learn about local cultural history.

Further down through Hunnedalen, a valley with steeper mountains than Sirdal, you will end up at **Byrkjedal** where we make a coffee stop at the café and candle factory. You will also be able to buy other local artifacts here.

We continue the journey through **Gloppedalsura** – Northern Europe's largest stone scree formed on top of a moraine from the Ice age. The scree was a famous resistance strong-hold during the German invasion and occupation of Norway in WW2. After the visit to Gloppedalsura, the bus continues back to Stavanger.

Wednesday: Archeology/Viking Tour of Stavanger area

Date: June 15, 2022
Time: 10:00 a.m. – 2:30 p.m.
Place: departure form and return to Clarion Hotel Energy
Fee: \$150
Included: Bus tour; Local archeology guide; lunch at Sola Strand Hotel.
Max number of participants: 16

Description



Visit the archeological places around Stavanger - a local archeologist will guide you and explain the history.

Vistehåla/Svartehola is a cave north of Stavanger. It served as a shelter for a group of about 25 people during the Neolithic period (since around 6000 BCE).

Jernaldergården (Iron Age farm) is a Farmstead from the migration period (350-550 AD) on the very top of Ullandhaug in Stavanger. The farm is reconstructed on the original archeological site.

Sverd i Fjell - three bronze swords stand 10 metres (33 ft) tall and are planted into the rock of a small hill next to the Hafrsfjord. They commemorate the historic Battle of Hafrsfjord which occurred at this location in the year 872, when King Harald Fairhair gathered all of Norway under one crown.

Lunch at the historic Sola Beach Hotel - dating from 1914, the hotel is idyllically situated by the sand dunes at Sola beach - one of Norway's most beautiful beaches.

Sola Ruinkirke is built on the remains of a Romanesque stone church from the early 12th century. Large parts of the church were demolished during World War II. The church was then rebuilt and restored in 1995.

Domsteinane - The stone circle is located near Stavanger International Airport, and is maybe one of Norway's most mysterious, ancient memories. For more than 250 years, archaeologists, historians and locals have pondered on its usage. Stone circles such as these are rare, and Domsteinene is one of the most characteristic stone circles in the Nordic countries.

Accommodations – Where to stay

Booking your accommodations at the SPWLA suggested hotel helps us meet our room block commitment and avoid penalties that could ultimately increase our conference expenses. **BOOK EARLY - GUARENTEES AND DISCOUNT RATES APPLY UNTIL MARCH 15!**



Book directly through the hotel:

email: cl.energy@choice.no
or by phone +47 51 347 800
Booking reference: **019342**



WAYS TO REGISTER

Pre-registration Deadline: Monday, May 23, 2022

 **Online at** www.spwla.org



By Mail: _____

Mail completed registration form to:

SPWLA Symposium
8866 Gulf Freeway, Suite 320
Houston, TX 77017



By Fax: +1-713-947-8747 _____

The fax line is open 24 hours. **DO NOT send another copy by mail.**

Full payment must accompany registration. Please register one attendee per form. If your spouse or guest is attending, be sure to include that person's full name for the computerized badge.
Members may not register as a spouse or guest.

REGISTRATION TYPE/PACKAGE INCLUDES

DELEGATES:

- ♦ Admission to technical program and exhibits
- ♦ Symposium transactions on USB
- ♦ Complimentary Tickets to Social Events (*Request On-site with Badge Pickup*)

SPOUSE/PARTNER:

- ♦ Admission to Spouse Hospitality Suite
- ♦ Admission to the Exhibition Hall



SPWLA 63RD ANNUAL LOGGING SYMPOSIUM
JUNE 11 – 15 2022, STAVANGER, NORWAY



- ◆ Complimentary Tickets to Social Events (*Request On-site with Badge Pickup*)

STUDENT:

- ◆ Admission to technical program and exhibits
- ◆ Symposium transactions on USB
- ◆ Complimentary Tickets to Social Events (*Request On-site with Badge Pickup*)



DAY PASS:

- \$500.00 per day (registration available on-site only)
- Admission to technical program and exhibits
- Symposium transactions on USB

How to pay for registration

Registration cannot be processed unless full payment is received with your registration form. Please register one attendee per form. If your spouse or guest is attending, be sure to include that person's full name for the computerized badge. **Delegates cannot register as a spouse or guest.** Payments may be made by:

- Check or Money Order payable in US dollars to: SP WLA Symposium
- Credit Card (Visa, Master Card, Discover or American Express)
- Wire Transfer (Bank Information must be requested by sending email to stephanie@spwla.org)

REGISTRATION*

Before May 23, 2022

\$ 950.00 SPWLA Member
\$ 1050.00 Non-member
\$ 100.00 Partner/Guest
\$ 30.00 Student
\$ 500.00 One Day Pass (Member)
\$ 600.00 One Day Pass (Non-Member)

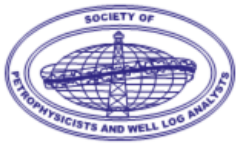
On-Site

\$ 1050.00 SPWLA Member
\$ 1150.00 Non-member
\$ 100.00 Partner/Guest
\$ 30.00 Student
\$ 500.00 One Day Pass (Member)
\$ 600.00 One Day Pass (Non-Member)

*Pre-registration payments will not be accepted after May 23, 2022.

On-Site Registration Hours

Saturday, June 11	7:00 a.m. to 5:00 p.m.
Sunday, June 1	7:00 a.m. to 5:00 p.m.
Monday, June 13	7:00 a.m. to 5:00 p.m.
Tuesday, June 14	7:30 a.m. to 5:00 p.m.
Wednesday, June 15	7:30 a.m. to 12:00 noon



CONFERENCE PROCEEDINGS

Conference Proceedings on USB are included in full registration fee. Additional copies may be purchased for \$40.00 each on site.

CONFIRMATION

You will receive a confirmation notice by email listing your registration fees and activities. Please check for accuracy. If, necessary, any changes in your registration (additions (will require additional payment) or deletions (refund request)), must be made through email to stephanie@spwla.org on or before May 23, 2022.

REQUEST FOR NAME CHANGE

All name substitutions addressed to stephanie@spwla.org before May 23, 2022, will be processed at no extra charge. Requests made thereafter and on-site will be subject to a \$35.00 processing fee.

CANCELLATION POLICY

General conditions - All cancellation notices must be made in writing to stephanie@spwla.org

Refunds will be issued after the Symposium in accordance with the Cancellation Terms and Conditions. Hotel cancellations must be made directly with the hotel.

CANCELLATION TERMS AND CONDITIONS

Registration, field trip, spouse/guest tours and workshop fees:

- Cancellation notices received on or before May 23, 2022:
Full refund less 25% admin fees
- Cancellation notices received after May 23, 2022:
No refund. Unused tickets are not refundable.

COMPLIMENTARY FUNCTIONS

Admittance to complimentary functions is by Ticket.

- Tickets will be available at the registration desk on-site.
- Tickets are 1 per registered guest.
- Tickets will be distributed on a first come, first serve basis.
- Tickets are not guaranteed.



Pre-Registration Form (Deadline May 23, 2022)

SPWLA Membership number: _____

Print Name

SPLWA Membership Status: ☐ Member

☐ Honorary ☐ Senior Member

☐ Student Member ☐ Non-Member

Please check one: ☐ Oil Company

☐ Service Company ☐ Software Company

☐ Independent ☐ Academia

☐ Retired ☐ Other

Check Please make payable to SPWLA. Send registration form and check to SPWLA, 8866 Gulf Freeway, Suite 320, Houston, TX 77017. Our office number is +1 713-947-8727.

Please make hotel reservations directly yourself, see page 58 in this brochure for more info. SPWLA has reserved rooms in the Clarion Energy Hotel until March 15, 2022. Reservations after this date are subject to availability.

Name (First, Last)

Nickname for badge (if desired)

Partner name for badge (ONLY if registering)

Company (name for badge)

Mailing Address

Mailing Address 2

City State/country Zip/postal code

Phone number (area/country code)

Fax number (area/country code)

Email

Special needs (dietary/disabled, etc)

Please check if applicable:

☐ 01/Former Int'l President

☐ 02/Former Int'l Officer

☐ 03/Current Chapter President

☐ 04/Speaker

Payment information

☐ Credit Card ☐ Check (enclose with form)

Credit Card: Visa / Master Card / Amex / Discover

Card Number

Expiry Date

CVV

Signature

¹Registration fees before May 23, 2022

Category	Before May 23	Cost
SPWLA Member ² (incl proceedings CD)	\$950	
Non-Member ² (incl proceedings CD)	\$1050	
Proceedings on CD (if NOT included in the registration)	\$40	
Partner/Spouse	\$100	
Student ³	\$30	
One Day Pass (member)	\$500	
One Day Pass (non-member)	\$600	

Note: One-day registrations can be made on-site only. ¹ Date as postmarked. ² Price included in registration fee. ³ Proof of status is required. Please attach a copy of student ID to this registration form.

Field trip and workshops (WS)

Date	Item	#	Fee	Costs
June 11	Field trip to the Bømlo ⁴		\$300	
June 11	Saturday workshop ⁵		\$500	
June 12	Sunday workshop ⁵		\$500	

⁴ Non-members pay \$400. ⁵ Non-registered (i.e. those only attending the workshop and not register for the symposium) pay \$600.

SPWLA Leadership luncheon

Date	Item	Fee	Costs
June 13	Annual business meeting + lunch	\$0	
June 14	Award presentation + lunch	\$0	

Guest/Partner Activities

Date	Item	#	Fee	Costs
June 13-15	Hospitality Suite		\$100	
June 12	Guided tour Jæren		\$?	
June 13	Boat Lysefjorden		\$?	
June 14	Guided tour Stavanger		\$?	

SPWLA Foundation

Donation	Fee	Costs
SPWLA Foundation General Donation	\$10	

TOTAL AMOUNT DUE (registration and all activities) \$

Scan completed form and e-mail to stephanie@spwla.org, or fax to +1-713-947-8747



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