MONDAY - JUNE 17th

8:00 **Opening Remarks -** Chairman – Jeff Crawford, Halliburton

8:15 **Keynote Speaker –** Arvind Sharma - Vice President, Data & Analytics at TGS

9:15 **Introduction of Technical Sessions -** Vice President of Technology – James "Jim" Hemingway

9:30 **Break**

Session 1 – FORMATION EVALUATION OF CONVENTIONAL RESERVOIRS I

Co-Chairpersons: Ron Deady, APS Technology & Ferdinanda Pampuri, ENI S.p.A.

This session will cover case histories, new technologies and studies in clastics as well as carbonates. New rock classification techniques are introduced and the effect of texture on log response is discussed.

10:00 **A** **INTEGRATED MULTI-PHYSICS WORKFLOW FOR AUTOMATIC ROCK CLASSIFICATION AND FORMATION EVALUATION USING MULTI-SCALE IMAGE ANALYSIS AND CONVENTIONAL WELL LOGS;** Andres Gonzalez, Lawrence Kanyan and Zoya Heidari, The University of Texas at Austin; Olivier Lopez, Equinor

10:20 **B** **A NEW APPARATUS FOR COUPLED LOW-FIELD NMR AND ULTRASONIC MEASUREMENTS IN ROCKS AT RESERVOIR CONDITIONS;** Paul R. J. Connolly, University of Western Australia, Joël Sarout and Jérémie Dautriat, CSIRO Energy; Eric F. May and Michael L. Johns, University of Western Australia

10:40 **C** **DIGITAL ROCK TECHNOLOGY FOR ACCELERATED RCA AND SCAL: APPLICATION ENVELOPE AND REQUIRED CORRECTIONS;** Nishank Saxena, Amie Hows, Ronny Hofmann, Omer Alpak, Justin Freeman, Matthias Appel and Jesse Dietderich, Shell

11:00 **D** **DEVELOPMENT OF A RESERVOIR ROCK DIELECTRIC DATABASE;** Matthew Josh, Michael B. Clennell and Lionel Esteban, CSIRO Energy; Matthew Hopkins, University of Western Australia

11:20 **E** **THE SENSITIVITY OF DIELECTRIC SIGNALS TO CATION EXCHANGE CAPACITY IN SHALY SAND FORMATIONS AND ITS DEPENDENCE ON SALINITY, POROSITY, AND TORTUOSITY;** Chang-Yu Hou, Denise E. Freed and Jeffrey Little, Schlumberger

11:40 **F** **HETEROGENEITY IN THE PETROPHYSICAL PROPERTIES OF CARBONATE RESERVOIRS IN TAL BLOCK;** Umar Farooq, Jawwad Ahmed and Saqib Ali, MOL Pakistan; Farrukh Siddiqi, Syed Asad Ali Kazmi and Kashif Mushir, Weatherford

12:00 - 1:15 LUNCH (Annual Business Meeting and Luncheon)

Session 2 – FORMATION EVALUATION BEHIND CASING

Co-Chairpersons: Jorge Sanchez-Ramirez, BHP & Hesham El-Sobky, ConocoPhillips

Formation evaluation techniques based on measurements made in cased wellbores including those that integrate openhole data with cased hole measurements. New measurements as well as techniques for better understanding existing measurements in cased wellbores will be presented.

1:20 **G** **LESSONS LEARNED FROM CASED-HOLE FORMATION EVALUATION ALONG UNCONVENTIONAL HORIZONTAL WELLS;** Michael Sullivan, Haijing Wang, Alexei Bolshakov, Lisa Song, Michael Lazorek, Vahid Tohidi and Yegor Se, Chevron

1:40 **H** **IMPACT OF CEMENT QUALITY ON CARBON/OXYGEN AND ELEMENTAL ANALYSIS FROM CASED-HOLE PULSED-NEUTRON LOGGING AND POTENTIAL IMPROVEMENT USING AZIMUTHAL CEMENT BOND LOGS;** Haijing Wang, Michael Sullivan, Yegor Se, David Barnes, Chevron ; Michael Wilson, Cabinda Gulf Oil Co. Ltd; Michael Lazorek, Chevron

2:00 **I** **THE NEUTRON DANCE: A QUEST FOR RELIABLE CASED-HOLE NEUTRON DATA FOR HIGH-TEMPERATURE STEAMFLOOD SURVEILLANCE;** Abbie V. Morgan, Ericka S. Harper and Andy S. Jerrett, Aera Energy LLC

2:20 **J** **A SECOND LIFE FOR A GIANT: CASED-HOLE PULSED NEUTRON LOGGING IN COMPLEX COMPLETIONS AND CHALLENGING FLUID SCENARIOS;** Gabriele Duci, Roberto Zarauti, Alessandro Fasto, Marco Pirrone and Giuseppe Galli, Eni S.p.A.

2:40 **Break**

Session 3 - E-POSTERS 1 (SESSION TIME 2:50 PM – 3:30 PM)

Chairpersons: Technology Committee

K *PS1* **EVALUATION OF LIGHT HYDROCARBON COMPOSITION, PORE SIZE AND TORTUOSITY IN ORGANIC-RICH CHALKS USING NMR CORE ANALYSIS AND LOGGING;** Zeliang Chen, Philip M. Singer, Xinglin Wang and George J. Hirasaki, Rice University; Harold J. Vinegar, Vinegar Technologies LLC

L *PS2* **WHAT IF THERE WAS A BETTER FORMATION-TESTING PROBE? A CASE STUDY ON OPTIMIZING FLOW GEOMETRY;** Camilo Gelvez and Carlos Torres-Verdín, The University of Texas at Austin, Yegor Se and Mayank Malik, Chevron Corporation

M *PS3* **ESTIMATING NET SAND FROM BOREHOLE IMAGES IN LAMINATED DEEPWATER RESERVOIRS WITH A NEUTRAL NETWORK;** Bo Gong, Dustin Keele, Emmanuel Toumelin and Simon Clinch, Chevron

N *PS4* **DISCOVERY OF NEW HORIZONS IN A 36 YEARS-OLD CONVENTIONAL OIL AND GAS PLAY BY UTILIZATION OF STATE-OF-THE-ART FORMATION EVALUATION APPROACHES: A CASE STUDY FROM THRACE BASIN, TURKEY;** Murat Fatih Tuğan and Ugur Yuce, Turkish Petroleum Corporation(TPAO)

O *PS5* **A RAPID NON-INVASIVE EVALUATION METHOD FOR RESERVOIR FLUID SAMPLES;** Ansgar Cartellieri, Erik Lehne and Maryam M. Alohaly, Baker Hughes a GE Company

P *PS6* **TOWARDS A PETROPHYSICALLY CONSISTENT IMPLEMENTATION OF ARCHIE'S EQUATION FOR HETEROGENEOUS CARBONATE ROCKS;** Raghu Ramamoorthy, Independent, T. S. Ramakrishnan, Suvodip Dasgupta and Ishan Raina, Schlumberger

Q *PS7* **RESERVOIR PRODUCIBILITY INDEX (RPI) BASED ON 2D NMR T_1-T_2 LOGS;** Ravinath Kausik, Schlumberger-Doll Research; Tianmin Jiang, Schlumberger; Lalitha Venkataramanan, Schlumberger-Doll Research; Albina Mutina, Erik Rylander and Richard Lewis, Schlumberger

R *PS8* **MORE ACCURATE QUANTIFICATION OF FREE AND ADSORBED GAS IN SHALE RESERVOIRS;** Rafay Ansari, German Merletti, Pavel Gramin and Peter Armitage, BP

S *PS9* **A MACHINE LEARNING FRAMEWORK FOR AUTOMATING WELL LOG DEPTH MATCHING;** Lin Liang, Thai Le, Timon Zimmermann, Smaine Zeroug and Denis Heliot, Schlumberger

T *PS10* **NEW 4¾-IN. ULTRASONIC LWD TECHNOLOGY PROVIDES HIGH-RESOLUTION CALIPER AND IMAGING IN OIL-BASED AND WATER-BASED MUDS;** Peng Li, Jonathan Lee, Richard Coates and Rodney Marlow, Halliburton

U *PS11* **ACCURATELY ESTIMATING SHEAR SLOWNESS USING DATA-DRIVEN QUADRUPOLE SONIC LOGGING-WHILE-DRILLING DATA PROCESSING;** Ruijia Wang and Richard Coates, Halliburton

V *PS12* **FEASIBILITY STUDY OF DERIVING WATER SATURATION FROM LWD NMR TRANSVERSE RELAXATION TIME IN TWO SILICICLASTIC RESERVOIRS IN CHINA;** Xin Zhou, Chanh Cao Minh, Schlumberger; Yunjiang Cui, Xinlei Shi, CNOOC; Shim Yen Ham, Schlumberger; Ting Li, Chevron Energy Technology Company

Session 4– NEW BOREHOLE LOGGING TECHNOLOGY

Co-Chairpersons: Clive Sirju, CNOOC Ltd & Donald L. Clarke, ExxonMobil

In this session new resistivity, dielectric, nuclear, fluid sampling and imaging tool design concepts and advancements will be presented and discussed.

3:40 **President's Message –** Jesús M. Salazar, Marathon Oil

3:50 **W** **A NEW MULTI-FREQUENCY ARRAY-DIELECTRIC LOGGING SERVICE: TOOL PHYSICS, FIELD TESTING, AND CASE STUDIES IN THE PERMIAN BASIN WOLFCAMP SHALE;** Stanislav Forgang, Bill Corley, Alejandro Garcia, Amer Hanif, Fei

Le, John Jones and Elton Frost Jr., Baker Hughes a GE Company; Stephanie Perry, Anadarko Petroleum Corporation

4:10 **X** **DIRECT MID-IR OPTICAL MEASUREMENT OF SYNTHETIC DRILLING FLUID FILTRATE CONTAMINATION DURING FORMATION-TESTER PUMPOUTS;** Ralph Piazza, Alexandre Vieira and Luiz Alexandre Sacorague, Petrobras, Christopher Jones, Bin Dai, Megan Pearl and Helen Aguiar, Halliburton

4:30 **Y** **IMPROVING PRODUCTION IN CHILD WELLS BY IDENTIFYING FRACTURES WITH AN LWD ULTRASONIC IMAGER: A CASE STUDY FROM AN UNCONVENTIONAL SHALE IN THE U.S.;** Claudia Amorocho, Cory Langford and Gregory Warot, Weatherford International, Erich Kerr and Ray Ambrose, EP Energy

4:50 **Z** **ENHANCING THE LOOK-AHEAD-OF-THE-BIT CAPABILITIES OF DEEP DIRECTIONAL RESISTIVITY MEASUREMENTS WHILE DRILLING;** Michael Thiel, Dzevat Omeragic and Jean Seydoux, Schlumberger

5:10 **AA** **GEOSTEERING IN COMPLEX CHANNEL SANDS: SUCCESSFUL USE OF A NEW HIGH DEFINITION INVERSION OF DEEP RESISTIVITY MEASUREMENTS;** Joseph Wilding-Steele, Alistair Maguire, Ferdinando Perna, Amarjit Bisain, Mirella Caso Salazar, Sigurd Nyboe, Ettore Mirto, Schlumberger; Lisa Draper, Andy Ronald, Jason Scott, Stewart Kirkley, Nandini Nagra, Richard Pattison and Michael Rabinovich, BP

5:30 **END OF SESSION**

TUESDAY - JUNE 18th

Session 5 – MACHINE LEARNING (AM-1 TOWN CENTER SOUTH)

Co-Chairpersons: Nadege Biz-Forest, Schlumberger & Weijun Guo, Halliburton

Reservoir characterization methods that use core or other database inputs and outputs to train model-independent mapping functions for predicting reservoir properties from well logging data (supervised learning) or methods that use pattern recognition or clustering algorithms for quality control of data and/or extraction of useful reservoir information (unsupervised learning).

8:00 **BB** **A DEEP-LEARNING APPROACH FOR BOREHOLE IMAGE INTERPRETATION;** Kinjal Dhar Gupta, Valentina Vallega, Hiren Maniar, Philippe Marza, Hui Xie, Koji Ito and Aria Abubakar, Schlumberger

8:20 **CC** **ROLE OF MACHINE LEARNING IN BUILDING MODELS FOR GAS SATURATION PREDICTION;** Yagna Deepika Oruganti, Peng Yuan, Feyzi Inanc, Yavuz Kadioglu, David Chace, Baker Hughes, A GE Company

8:40 **DD** **QUANTITATIVE INTERPRETATION OF OIL-BASE MUD MICRORESISTIVITY IMAGER VIA ARTIFICIAL NEURAL NETWORKS;** Zikri Bayraktar, Dzevat Omeragic and Yong-Hua Chen, Schlumberger-Doll Research

9:00 **EE** **ENHANCED RESERVOIR GEOSTEERING AND GEOMAPPING FROM REFINED MODELS OF ULTRA-DEEP LWD RESISTIVITY INVERSIONS USING MACHINE-LEARNING ALGORITHMS;** Hsu-Hsiang (Mark) Wu, Li Pan, Jin Ma, Weixin Dong, Yijing Fan, Clint Lozinsky and Michael Bittar, Halliburton

9:20 **FF** **A MULTI-SCALE PATH FOR THE CHARACTERIZATION OF HETEROGENEOUS KARST CARBONATES: HOW LOG-TO-SEISMIC MACHINE LEARNING CAN OPTIMIZE HYDROCARBON PRODUCTION;** Francesco Bigoni, Marco Pirrone, Fabio Pinelli, Gianluca Trombin and Fabio Vinci, Eni S.p.A.

Session 6 – FORMATION EVALUATION OF CONVENTIONAL RESERVOIRS II (AM-1 WATERWAY 4)

Co-Chairpersons: John Zhou, Maxwell Dynamics & Clive Sirju, CNOOC Ltd

This session will cover case histories, new and improved technologies in clastics as well as carbonates where fluid type and textural variability influence log response.

8:00 **GG** **A NEW WORKFLOW FOR JOINT INTERPRETATION OF ELECTRICAL RESISTIVITY AND NMR MEASUREMENTS TO SIMULTANEOUSLY ESTIMATE WETTABILITY AND WATER SATURATION;** Chelsea Newgord, Artur Posenato Garcia and Zoya Heidari, The University of Texas at Austin

8:20 **HH** **TEMPERATURE CORRECTION MODELS FOR NMR RELAXATION TIME DISTRIBUTION IN CARBONATE ROCKS;** Gabor Husan and Shouxiang Ma, Saudi Aramco; Wei Shao and Songhua Chen, Halliburton

8:40 **II** **ESTIMATING CAPILLARY PRESSURE FROM NMR MEASUREMENTS USING A PORE-SIZE-DEPENDENT FLUID SUBSTITUTION METHOD;** You Wang, David Medellin and Carlos Torres-Verdín, The University of Texas at Austin

9:00 **JJ** **PORE-SIZE-DEPENDENT FLUID SUBSTITUTION METHOD FOR IMPROVED ESTIMATION OF NMR POROSITY, PERMEABILITY, AND RELAXATION TIMES;** David Medellin, Ali Eghbali, You Wang and Carlos Torres- Verdín, The University of Texas at Austin

9:20 **KK** **CORE-LOG-GEOMODEL INTEGRATION: ADVANCED CLASSIFICATION AND PROPAGATION WORKFLOWS FOR THE CONSISTENT, RIGOROUS, AND PRACTICAL UPSCALING OF PETROPHYSICAL PROPERTIES;** Alan A. Curtis and Eric Eslinger, e*GAMLS* Inc.; Siva Nookala, Cerone Pvt Ltd.

9:40 **Break**

Session 7 - E- POSTERS 2 (Session Time 9:50 AM – 10:30 AM)

Chairpersons: Technology Committee

LL *PS1* **TURNING A NEGATIVE INTO A POSITIVE: SHALE ANNULAR BARRIER IDENTIFICATION FOR PLUG AND ABANDONMENT;** David Lavery, Venkat Jambunathan, Halliburton; Gulnara M. Shafikova, Vår Energi AS

MM *PS2* **INTEGRATED RESERVOIR CHARACTERIZATION IN DEEPWATER GULF OF MEXICO USING NUCLEAR MAGNETIC RESONANCE (NMR) FACTOR ANALYSIS AND FLUID SUBSTITUTION;** Tianmin Jiang, Jason Gendur, Li Chen, Weixin Xu, Dan Shan,Schlumberger; Tom Hall, Tim Wilkinson, Ben Winkelman, TALOS Energy; Nnadozie Nwosu, Jesus Alberto Cañas and Ron Hayden, Schlumberger

NN*PS3* **RECONCILING THE MODELED LOG AND CORE BASED SATURATION HEIGHT FUNCTIONS: A CASE STUDY FROM A GAS-CONDENSATE RESERVOIR;** Suryanarayana Karri, Sproule; Ernesto Pinto and Mateus da Costa, Autoridade Nacional do Petróleo e Minerais – Timor Leste

OO *PS4* **THE IMPACT OF PETROPHYSICAL UNCERTAINTY IN FORMATION EVALUATION AND RESERVOIR MODELLING– A ROBUST METHODOLOGY;** Niccolò Ceresa, Michele Arcangeli, Maria Teresa Galli, Paola Cardola and Paolo Scaglioni, ENI SpA

PP*PS5* **DETERMINING RESISTIVITY AND LOW-FREQUENCY DIELECTRIC CONSTANT USING INDUCTION DATA IN THE PRESENCE OF STRONG INDUCED POLARIZATION;** Gong Li Wang, Dean M. Homan, Natalie Uschner-Arroyo, Ping Zhang, Wael Abdallah and Nasar Khan, Schlumberger

QQ *PS6* **MICRO/NANOFLUIDIC INSIGHTS ON FLUID DELIVERABILITY CONTROLS IN TIGHT ROCKS;** Ayaz Mehmani, The University of Texas at Austin; Shaina Kelly, ConocoPhillips, and Carlos Torres-Verdín; The University of Texas at Austin

RR *PS7* **ADVANCED PETROPHYSICAL APPLICATIONS FOR THE AUSTRALIAN MINING INDUSTRY;** Jennifer Market, Lloyd's Register/MPC Kinetic; Huw Rossiter and Brenton Armitage, MPC Kinetic

SS *PS8* **CLASS-BASED MACHINE LEARNING FOR NEXT GENERATION WELLBORE DATA PROCESSING AND INTERPRETATION;** Vikas Jain, Po-Yen Wu, Ridvan Akkurt, Brook Hodenfield, Tianmin Jiang, Yuki Maehara, Vipin Sharma, Aria Abubakar, Schlumberger

TT *PS9* **NEW ADVANCED MATERIAL AND COATING TECHNIQUE FOR TRACE HYDROGEN SULFIDE SAMPLING;** Christopher Jones, Jimmy Price, Mickey Pelletier, William Soltmann, Darren Gascooke and Anthony van Zuilekom, Halliburton

UU *PS10* **A CONCEPT PLATFORM FOR HIGHLY EFFICIENT AND ACCURATE PRESSURE, SAMPLING AND SIDEWALL CORING OPERATIONS USING WIRELINE CONVEYANCE;** German Garcia, Hadrien Dumont, Vinay K. Mishra, Li Chen, Ron Hayden and Christopher Babin, Schlumberger

VV *PS11* **WELLBORE CHARACTERIZATION THROUGH MULTI-DIMENSIONAL VISUALIZATION PROVIDES MECHANICAL INTEGRITY SURVEILLANCE SOLUTIONS BEYOND THE CURRENT NORM;** Gary Frisch, Phil Fox and Roddy Hebert, Halliburton

WW*PS12* **CHARACTERIZATION AND PRODUCTION INFLUENCE OF GEOLOGICAL FACIES IN THE EAGLE FORD;** Bhaskar Sarmah, Nicholas Garrison and Eli Bogle, Halliburton; Katie Ross and Patrick Noon, SM Energy

Session 8 – FORMATION EVALUATION OF CONVENTIONAL RESERVOIRS III (AM-2 TOWN CENTER SOUTH)

Co-Chairpersons: Philip Singer, Rice University & Iulian Hulea, Shell

This session will cover case histories, new and improved technologies in clastics as well as carbonates. Fluid properties and their effect on log response will be presented.

10:40 **XX** **DIVERSE FLUID GRADIENTS ASSOCIATED WITH BIODEGRADATION OF CRUDE OIL;** Oliver C. Mullins, Schlumberger, Yngve Bolstad Johansen and Joachim Rinna, AkerBP, John Mayer, Kosmos, Steve Kenyon-Roberts, Premier, Li Chen, Julia C. Forsythe, Vladislav Achourov, Richard Jackson, Soraya S. Betancourt, Julian Y. Zuo and Jesus A. Canas, Schlumberger

11:00 **YY** **WETTABILITY ASSESSMENT IN COMPLEX FORMATIONS USING NMR MEASUREMENTS: WORKFLOW DEVELOPMENT AND EXPERIMENTAL CORE-SCALE VERIFICIATION;** Chelsea Newgord, Saurabh Tandon and Zoya Heidari, The University of Texas at Austin

11:20 **ZZ** **COMBINING LOGGING-WHILE-DRILLING (LWD) RESISTIVITY AND CAPTURE SIGMA (Σ) TO IDENTIFY AND EVALUATE WATER FLOOD ENCROACHMENT - CASE STUDY OF A FIELD WITH MULTI-LAYERED, COMPLEX RESERVOIRS;** Doug Murray and Nadileiny Silva, Schlumberger; Miguel Ascanio, Cabinda Gulf Oil Company Ltd.

11:40 **AAA** **FAST FORWARD MODELING OF BOREHOLE NUCLEAR MAGNETIC RESONANCE MEASUREMENTS IN VERTICAL WELLS;** Mohammad Albusairi and Carlos Torres-Verdín, University of Texas at Austin

Session 9 – COMPLETIONS, RESERVOIR AND PRODUCTION SURVEILLANCE (AM-2 WATERWAY 4)

Co-Chairpersons: Giuseppe Galli, Eni S.p.A. & Lu Chi, Halliburton

Rock mechanics, completion optimization, case studies and reservoir design using enhanced recovery techniques will be covered.

10:40 **BBB** **EVALUATION OF THE ROCK BRITTLENESS AND TOTAL ORGANIC CARBON OF ORGANIC SHALE USING TRIPLE COMBO;** Anshul Dubey, Selman & Associates Ltd.; Mohamed Ibrahim Mohamed, Colorado School of Mines; Mohamed Salah, Khalda Petroleum; Ahmed Algarhy, Marietta College

11:00 **CCC** **A PETRO-MECHANICAL APPROACH TO COMPLETIONS OPTIMIZATION IN THE BAKKEN;** Carrie Glaser, Fracture ID, Kyle Trainor, NP Energy Services; Joel Mazza, Fracture ID

11:20 **DDD** **NOVEL COUPLING SMART WATER -CO_2 FLOODING FOR SANDSTONE RESERVOIRS; SMART SEAWATER-ALTERNATING- CO_2 FLOODING (SMSW-AGF);** Hasan Al-Saedi, Missouri University of Science and Technology/Missan Oil Company; Ralph E. Flori, Missouri University of Science and Technology

11:40 **EEE** **'LOG-SOAK-LOG' EXPERIMENT IN TENGIZ FIELD: NOVEL TECHNOLOGY FOR IN SITU IMBIBITION MEASUREMENTS TO SUPPORT AN IMPROVED OIL RECOVERY PROJECT;** Yegor Se, TengizChevroil; Mauricio Villegas, Chevron; Elrad Iskakov and Ted Playton, TengizChevroil; Karl Lindsell and Ernesto Cordova, SPE; Aizhan Turmanbekova, TengizChevroil; Haijing Wang, Chervron

12:00 – 1:15 **LUNCH (Awards Presentation Luncheon**)

Session 10 – FORMATION EVALUATION OF CONVENTIONAL RESERVOIRS IV (PM -1 TOWN CENTER SOUTH)

Co-Chairpersons: Ferdinanda Pampuri, Eni S.p.A. & E.C. Thomas, Consultant

This session will cover case histories, new technologies and studies in a variety of reservoirs. New rock and fluid classification techniques are introduced and the effect of texture on log response is discussed.

1:30 **FFF** **IMPROVING PRODUCTIVITY ESTIMATION IN DEVELOPMENT WELLS USING LWD FORMATION TESTERS AND GEOCHEMICAL LOGS;** Ting Li and Chanh Cao Minh, Schlumberger, Xinlei Shi, CNOOC

1:50 **GGG** **CONNECTIVITY, ASPHALTENE, MOLECULES, ASPHALTENE GRADIENTS AND CO_2 GRADIENTS IN A BRAZILIAN CARBONATE PRESALT FIELD;** Andre C. Bertolini, Jacyra Monteiro, Jesus Alberto Canas, Soraya S. Betancourt, Oliver C. Mullins, Santiago Esteban Colacelli and Ralf K. Polinski, Schlumberger

2:10 **HHH** **THE FINAL PIECE OF THE PUZZLE: 3-D INVERSION OF ULTRA-DEEP AZIMUTHAL RESISTIVITY LWD DATA;** Nigel Clegg, Timothy Parker and Bronwyn Djefel, Halliburton; Luc Monteilhet, ConocoPhillips; David Marchant, Computational Geosciences Inc.

2:30 **III** **MULTI-FREQUENCY INTERPRETATION OF ELECTRIC RESISTIVITY AND DIELECTRIC PERMITTIVITY MEASUREMENTS FOR SIMULTANEOUS ASSESSMENT OF POROSITY, WATER SATURATION, AND WETTABILITY;** Artur Posenato Garcia, Zoya Heidari and Carlos Torres-Verdín, The University of Texas at Austin

Session 11 – FORMATION EVALUATION OF UNCONVENTIONAL RESERVOIRS I

(PM -1 WATERWAY 4)

Co-Chairpersons: Jesús M. Salazar, Marathon Oil & Mehrnoosh Saneifar, Chevron

New technologies, case histories and techniques that are designed for the specific issues faced by operators in tight oil/gas formations and shale-rich formations.

1:30 **JJJ** **THERMAL MATURITY-ADJUSTED LOG INTERPRETATION (TMALI) IN ORGANIC SHALE;** Paul R. Craddock, Schlumberger-Doll Research, Richard E. Lewis, Schlumberger, Jeffrey Miles and Andrew E. Pomerantz, Schlumberger-Doll Research

1:50 **KKK** **RELIABLE MEASUREMENT SATURATION-DEPENDENT RELATIVE PERMEABILITY IN TIGHT ROCK SAMPLES;** Andres Gonzalez, Saurabh Tandon and Zoya Heidari, The University of Texas at Austin; Pavel Gramin and German Merletti, BP

2:10 **LLL** **HIGH-RESOLUTION MINERALOGY MODELING- A CASE STUDY IN THE VACA MUERTA FORMATION, NEUQUÉN BASIN, ARGENTINA;** Hao Zhang, Nora Alarcon and Guillermo Crespo, Baker Hughes, a GE Company; Diego Licitra, YPF; Carlos Fernandez, Chevron LC YPF

2:30 **MMM** **IMPROVED ANALYSIS OF NMR MEASUREMENTS IN ORGANIC-RICH MUDROCKS THROUGH QUANTIFYING HYDROCARBON-KEROGEN INTERFACIAL RELAXATION MECHANISMS;** Saurabh Tandon and Zoya Heidari, The University of Texas at Austin

2:50 **Break**

Session 12 - <u>E-POSTERS 3 (Session Time 3:00 PM – 3:40 PM)</u>

Chairpersons: Technology Committee

NNN *PS1* **A NEUTRON-INDUCED GAMMA-RAY SPECTROSCOPY LOGGING METHOD FOR DETERMINING FORMATION WATER SALINITY;** Lili Tian, China University of Petroleum; Feng Zhang, China University of Petroleum and Key Laboratory of Deep Oil and Gas; Quanying Zhang, Qian Chen, China University of Petroleum; Xinguang Wang, China University of Petroleum and Key Laboratory of Deep Oil and Gas; Fei Qiu, China University of Petroleum

OOO *PS2* **WAVELENGTH-BASED AXIAL RESOLUTION LIMITATIONS OF FLEXURAL WAVE DISPERSION SONIC LOGGING;** Kristoffer Walker, Chevron ETC; Qingtao Sun and Ruijia Wang, Halliburton

PPP*PS3* **INTEGRATED RESERVOIR AND SOURCE ROCK CHARACTERIZATION: REFINED DOWNHOLE ANALYSES THROUGH ADVANCED SURFACE LOGGING TECHNOLOGY;** Alessandro Pozzi and Filippo Casali, Geolog; Roselin Ebiakobo-Ngoma-Itoba, TOTAL; Antonio Bonetti, Geolog; Audrey Aymar Nkie-Ndion, TOTAL, Mario Ruggiero, Geolog, Emmanuel Caroli, TOTAL

QQQ *PS4* **INVERSION OF HIGH-RESOLUTION HIGH-QUALITY SONIC COMPRESSIONAL AND SHEAR LOGS FOR UNCONVENTIONAL RESERVOIRS;** Ting Lei, Smaine Zeroug, Sandip Bose, Romain Prioul and Adam Donald, Schlumberger

RRR *PS5* **QUANTIFYING BITUMEN PLUGGING IN TIGHT GAS RESERVOIR USING NMR AND PULSED-NEUTRON SPECTROSCOPY LOGGING;** Azzan Al-Yaarubi, Schlumberger; Khalsa Al-Hadidi, Rinat Lukmanov, Ali Al-Mahrouqi and Marcel Elie, Petroleum Development Oman

SSS *PS6* **CARBONATE LOG INTERPRETATION MODELS BASED ON MACHINE LEARNING TECHNIQUES;** Wei Shao, Songhua Chen, Mahmoud Eid, Halliburton; Gabor Hursan, Saudi Aramco RDD

TTT *PS7* **LEVERAGING PROBABILISTIC MULTIVARIATE CLUSTERING ANALYSES OF WELL LOGS TO IDENTIFY "SWEET SPOT" INTERVALS IN HETEROGENEOUS CONVENTIONAL AND UNCONVENTIONAL RESERVOIRS;** Eric Eslinger, Francis Boyle and Alan A. Curtis, eGAMLS Inc.

UUU *PS8* **REAL-TIME DOWNHOLE MID-IR MEASUREMENT OF CARBON DIOXIDE CONTENT;** Ralph Piazza, Alexandre Vieira and Luiz Alexandre Sacorague, Petrobras; Christopher Jones, Bin Dai, Megan Pearl and Helen Aguiar, Halliburton

VVV *PS9* **WELL DEPTH MEASUREMENT QUALITY IMPROVEMENT: QUANTIFYING UNCERTAINTY FOR ALONG-HOLE DEPTH;** Harald Bolt, Depth Solutions Ltd.

WWW *PS10* **FIELD TEST OF A HTHP LATEROLOG-TYPE ARRAY RESISTIVITY AND IMAGING WHILE DRILLING TOOL;** Qiming Li, Ting Lau, Kirk Gee, Jane Kong, Jason Gong, Jeff Aron, James Mather, Oliden Technology, LLC; Anzong Li and Sijia Chen, CNPC

XXX *PS11* **FROM THE BOREHOLE WALL INTO THE FORMATION – COMBINING BOREHOLE IMAGES WITH DEEP SHEAR WAVE IMAGING TECHNOLOGY;** Stefan Schimschal, Stephen Fayers, Nicklas Ritzmann and Martin Cox, Baker Hughes, a GE Company; Iain Whyte, Tullow Oil

YYY*PS12* **IDENTIFICATION OF BITUMEN IN NAJMAH SOURCE ROCK, UTILIZING ORGANIC AND INORGANIC ANALYSIS, A CASE STUDY;** Jalal Dashti, Kuwait Oil Company; Ahmad Shoeibi, Javad Estarabadi and Antonio Bonetti, Geolog International

3:45 **Break**

Session 13 – FORMATION EVALUATION OF UNCONVENTIONAL RESERVOIRS II (PM -2 TOWN CENTER SOUTH)

Co-Chairpersons: Sap Basu, ConocoPhillips & Jennifer Market, Lloyd's Register

New technologies, case histories and techniques that are designed for the specific issues faced by operators in tight oil/gas formations as well as shale-rich formations. Techniques to better understand rock and fluid parameters are used to make better completion design decisions.

3:50 **ZZZ** **INVESTIGATION OF PHYSICAL PROPERTIES OF HYDROCARBONS IN UNCONVENTIONAL MUDSTONES USING TWO-DIMENSIONAL NMR RELAXOMETRY;** Z. Harry Xie and Zheng Gan, Core Laboratories L.P.

4:10 **AAAA** **CRUSHED ROCK ANALYSIS WORKFLOW BASED ON ADVANCED FLUID CHARACTERIZATION FOR IMPROVED INTERPRETATION OF ACQUIRED CORE DATA;** Melanie Durand, Anton Nikitin, Adam McMullen, Aidan Blount, Brian Driskill and Amie Hows, Shell

4:30 **BBBB** **INTEGRATING PILOT AND LATERAL OPENHOLE MEASUREMENTS FOR LATERAL LANDING POINT ASSESSMENT AND HYDRAULIC FRACTURE DESIGN – A CASE STUDY FROM THE DELAWARE BASIN, WEST TEXAS;** Edgar Velez, Farhan Alimahomed, Elia Haddad, Irina Mikhaltseva, Andrew Dodds, Lance Smith and Jorge Gonzalez, Schlumberger

4:50 **CCCC** **LEVERAGING DIGITAL ROCK PHYSICS WORKFLOWS IN UNCONVENTIONAL PETROPHYSICS: A REVIEW OF OPPORTUNITIES, CHALLENGES, AND BENCHMARKING;** Ayaz Mehmani, The University of Texas at Austin; Shaina Kelly, ConocoPhillips, and Carlos Torres-Verdín; The University of Texas at Austin

Session 14 – NEW BOREHOLE LOGGING TECHNOLOGY II
(PM -2 WATERWAY 4)

Co-Chairpersons: Philip Singer, Rice University & Geoff Page, Baker Hughes-GE

In this session we will present advances in resistivity, nuclear and imaging tool design. Data analysis techniques and their applications we be covered.

3:50 **DDDD** **CAN THE EVALUATION ACCURACY OF ELEMENTAL CONCENTRATION BE FURTHER ENHANCED IN GEOCHEMICAL LOGGING?—A BREAK ATTEMPT TO OBTAIN PURER INELASTIC GAMMA SPECTRUM;** Chao Yuan, Chaoliu Li and Cancan Zhou, PetroChina Research Institute of Petroleum Exploration and Development; Guoqiang Liu, PetroChina Exploration and Development; Hongliang Wu and Zhou Feng, PetroChina Research Institute of Petroleum Exploration and Development; Juntao Liu, Lanzhou University

4:10 **EEEE** **ADVANCED LWD OIL-BASED MUD (OBM) IMAGING IN CHALLENGING SUB-SALT DEEPWATER ENVIRONMENTS;** Wilson Pineda, Jennifer Wadsworth, Dann Halverson, Genevive Mathers, and Gerardo Cedillo, BP; Carlos Maeso, David Maggs and Hathairat Watcharophat, Weixin (Wayne) Xu, Schlumberger

4:30 **FFFF** **FAST BAYESIAN INVERSION METHOD FOR THE GENERALIZED PETROPHYSICAL AND COMPOSITIONAL INTERPRETATION OF MULTIPLE**

WELL LOGS WITH UNCERTAINTY QUANTIFICATION; Tianqi Deng, Joaquín Ambía and Carlos Torres-Verdín, University of Texas at Austin

4:50 **GGGG** **REAL-TIME EM LOOK-AHEAD: A MATURING TECHNOLOGY TO DECREASE DRILLING RISK IN LOW INCLINATION WELLS;** Jean Seydoux, Jean-Michel Denichou, Irlan Amir, Vera Wibowo, Thorsten Bauch, Diogo Salim, Mauro Viandante, Shim Yen Han, Chao Wang, Guillermo Cuadros, Michiko Hamada, Sarwa Tan, Yao Feng Soazig Leveque, Schlumberger

5:10 **END OF SESSION**

WEDNESDAY – JUNE 19TH

Session 15 – MACHINE LEARNING II

Co-Chairpersons: Nadege Bize-Forest, Schlumberger & Weijun Guo, Halliburton

Reservoir characterization methods that use core or other database inputs and outputs to train model-independent mapping functions for predicting reservoir properties from well logging data (supervised learning) or methods that use pattern recognition or clustering algorithms for quality control of data and/or extraction of useful reservoir information (unsupervised learning).

8:00 **HHHH** **DOMAIN TRANSFER ANALYSIS – A ROBUST NEW METHOD FOR PETROPHYSICAL ANALYSIS;** Ravi Arkalgud, Helio Flare Limited; Andrew McDonald and Derek Crombie, Lloyd's Register

8:20 **IIII** **USING A PHYSICS-DRIVEN DEEP NEURAL NETWORK TO SOLVE INVERSE PROBLEMS FOR LWD AZIMUTHAL RESISTIVITY MEASUREMENTS;** Yuchen Jin, Xuqing Wu and Jiefu Chen, University of Houston, Yueqin Huang, Cyentech Consulting LLC

8:40 **JJJJ** **AUTOMATED RESISTIVITY INVERSION AND FORMATION GEOMETRY DETERMINATION IN HIGH-ANGLE AND HORIZONTAL WELLS USING DEEP LEARNING TECHNIQUES;** Hu Li, Maxwell Dynamics Inc., Gang Liu, Shansen Yang, Ying Guo, He Huang, Mingzong Dai, Yuanshi Tian, CNPC Logging

9:00 **KKKK** **ESTIMATION OF DYNAMIC PETROPHYSICAL PROPERTIES FROM MULTIPLE WELL LOGS USING MACHINE LEARNING AND UNSUPERVISED ROCK CLASSIFICATION;** Mohamed Bennis and Carlos Torres-Verdín, The University of Texas at Austin

9:20 **LLLL** **ARTIFICIAL INTELLIGENCE APPLIED TO NMR LOGGING FOR ROCK AND FLUID TYPING IN HEAVY OILS;** Pedro A. Romero Rojas, Alexandrina Cristea and Paul Pavlakos, Weatherford, Okan Ergündüz, Tayfun Keçecioğlu and Server Fatih Alpay, ARAR

9:45 **Break**

Session 16 - E-POSTERS 4 (Session Time 9:55 AM – 10:35 AM)

Chairpersons: Technology Committee

MMMM *PS1* **A NEW PETROPHYSICAL CORRELATION FOR THE PERMEABILITY OF CARBONATE ROCKS;** Yuhai Zhou, Ding Zhu and A. D. Hill, Texas A&M University

NNNN *PS2* **EXPERIMENTAL ESTIMATION OF RELATIVE PERMEABILITIES THROUGH COMPUTED TOMOGRAPHY;** Andrés Felipe Ortiz Meneses, Luis Felipe Carillo M., Edwar Hernando Herrera Otero, Nicolás Santos Santos and, Universidad Industrial de Santander

OOOO *PS3* **DOWNHOLE NEUTRON-INDUCED SPECTROSCOPY ELEMENT AND MINERAL ESTIMATES COMPARED TO A RING TESTED CORE REFERENCE;** Yngve B. Johansen and Olav-Magnar Nes, AkerBP, Harish Datir, Schlumberger, Lalitha Venkataramanan and Paul R. Craddock, Schlumberger-Doll Research Center

PPPP *PS4* **INTEGRATED PETROPHYSICAL INTERPRETATION AND WORKFLOW FOR STACKED TIGHT GAS SANDS USING MODERN EVALUATION TECHNIQUES: NORTH LOUISIANA MULTIWELL CASE STUDY;** Rojelio Medina, Halliburton; Luke Fidler, Range Resources; Nick Garrison, Bhaskar Sarmah and John Quirein, Halliburton

QQQQ *PS5* **FEASIBILITY OF DIGITAL ROCK PHYSICS FOR STATIC AND DYNAMIC RESERVOIR PROPERTY CHARACTERIZATION IN CARBONATE RESERVOIRS-I;** Shruti Malik and Ravi Sharma, Indian Institute of Technology, Roorkee

RRRR *PS6* **AUTO-NAVIGATION OF OPTIMAL FORMATION PRESSURE TESTING LOCATIONS BY MACHINE LEARNING METHODS;** Bin Dai, Christopher Jones, James Price and Anthony van Zuilekom, Halliburton

SSSS *PS7* **AUTOMATIC INTERPRETATION OF WELL LOGS WITH LITHOLOGY-SPECIFIC DEEP-LEARNING METHODS;** Aymeric-Pierre Peyret, Joaquín Ambía and Carlos Torres-Verdín, The University of Texas at Austin; Joachim Strobel, Wintershall GmbH

TTTT *PS8* **A NEW THROUGH-CASING ACOUSTIC LOGGING TOOL USING DUAL-SOURCE TRANSMITTERS;** Xiaoming Tang and Yuanda Su, China University of Petroleum (East); Bo Zhang, Shuoren Times Technology

UUUU *PS9* **MONITORING CO_2 SATURATION USING THREE-DETECTOR PNC LOGGING TECHNIQUE FOR CO_2 EOR IN HEAVY OIL RESERVOIR;** Feng Zhang, China University of Petroleum and Key Labortory of Deep Oil and Gas; Quanying Zhang and Lili Tian, China University of Petroleum; Xiaoyang Zhang, Qingdao University of Science and Technology; Qian Chen and Jilin Fan, China University of Petroleum

VVVV *PS10* **DEDUCTING DISPERSIVE PERMITTIVITY FROM LWD RESISTIVITY MEASUREMENTS;** Stein Ottar Stalheim, Equinor

WWWW *PS11* **CEMENT BOND EVALUATION WITH A LOGGING-WHILE-DRILLING SONIC TOOL;** Ruijia Wang, Chung Chang, Richard Coates, Jonathan Lee and Franck Michel, Halliburton; Morgan Halbert and Jeremy McCaslin, Shell Offshore

10:40 **Break**

Session 17 – CASE STUDIES

Co-Chairpersons: Giuseppe Galli, Eni S.p.A. & Iulian Hulea, Shell

Case studies and the results of new techniques and models will be compared with actual results.

10:45 **XXXX** **UNCERTAINTY ANALYSIS IN FORMATION EVALUATION: RATIONALE, METHODS AND EXAMPLES;** Philippe Gaillot, Jerome Lewandowski and Roza Nursaidova, ExxonMobil

11:05 **YYYY** **LWD RESISTIVITY ANOMALIES IN OVERBURDEN SECTIONS PROVIDE CRITICAL INFORMATION ON DRILLING SAFETY AND BOREHOLE STABILITY: GULF OF MEXICO CASE STUDIES;** Michael Rabinovich, John Bergeron, Gerardo Cedillo, Maryam Mousavi, Wilson Pineda, Eric Soza, BP; Jeffry Hamman, BP Retired; Fei Le, Hans-Martin Maurer, Baker Hughes a GE Company; Ettore Mirto, Keli Sun, Schlumberger

11:25 **ZZZZ** **ESTIMATION OF THOMSEN'S EPSILON AND DELTA IN A SINGLE CORE USING ULTRASONIC PHASE AND GROUP VELOCITY MEASUREMENTS;** Gabriel Gallardo-Giozza, D. Nicolás Espinoza and Carlos Torres-Verdín, The University of Texas at Austin; Elsa Maalouf, American University of Beirut

11:45 **AAAAA** **IMAGING, HIGH RESISTIVITY CARBONATE RESERVOIR DELINEATION AND WELL PLACEMENT – APPLICATION OF A NEW HTHP RESISTIVITY IMAGING WHILE DRILLING TOOL IN CHINA;** Anzong Li, Chuanwei Li, Sijia Chen, Jun Zhu, Gang Chen, Zunbo Geng, China Petroleum Logging Co.Ltd; Qiming Li, Oliden Technology

12:05 – 1:20 **LUNCH (Leadership Luncheon**)

Session 18 – CONVENTIONAL AND NEW TECHNOLOGY

Co-Chairpersons: Ron Deady, APS Technology & John Zhou, Maxwell Dynamics

This session will cover case histories, new technologies and studies in clastics as well as carbonates covering low contrast pay, thin beds, fresh formation water etc.

1:30 **BBBBB** **NMR MEASUREMENT OF POROSITY AND DENSITY FROM DRILL CUTTING OF UNCONVENTIONAL TIGHT RESERVOIRS;** Stacey M. Althaus, Jin-Hong Chen and Jilin Zhang, Aramco Services Company

1:50 **CCCCC** **PETROPHYSICAL EVALUATION OF THINLY-LAMINATED DEPOSITIONAL SEQUENCES USING STATISTICAL MATCHING PROCEDURES**; David Gonzalez, Joaquín Ambía and Carlos Torres-Verdín, The University of Texas at Austin

2:10 **DDDDD** **APPLICATION OF AN INTEGRATED PETROPHYSICAL MODELING TO IMPROVE LOG-BASED RESERVOIR CHARACTERIZATION AND OIL IN-PLACE ESTIMATE**

OF A FRESH WATER SHALY SAND RESERVOIR; Sushanta Bose, WD Von Gonten & Company; Michael T. Myers, Peila Chen and Ganesh C. Thakur, University of Houston

2:30 **EEEEE** **EXPERIMENTAL INVESTIGATION OF MUD-FILTRATE INVASION USING RAPID MICRO-CT IMAGING;** Colin Schroeder and Carlos Torres-Verdín, The University of Texas at Austin

2:50 **Break**

Session 19 – NEW BOREHOLE LOGGING TECHNOLOGY III

Co-Chairpersons: Mehrnoosh Saneifar, Chevron & Geoff Page, Baker Hughes-GE

In this session we will present advances in resistivity, nuclear and sonic tool response. Data analysis techniques and their applications we be covered.

3:10 **FFFFF** **PRE-JOB PLANNING BASED ON NUCLEAR MODELING LEADS TO SUCCESSFUL DOWNHOLE MINERALOGY DETERMINATION IN EXTREMELY CHALLENGING LOGGING CONDITIONS;** Haijing Wang, Lorelea Samano, Kenneth D. Kelsch, Ela Manuel and Janet Yun, Chevron

3:30 **GGGGG** **FROM HOUSTON API CALIBRATION PITS… TO ARTIGUELOUTAN LOGGING METROLOGICAL FACILITY;** Pierre Chuilon, Gilles Puyou and Emmanuel Caroli, TOTAL SA, Thibaud Vandamme, Modis; José Inciarte, Maciej Kozlowski and Bill Dillon, Halliburton

3:50 **HHHHH** **INTEGRATED RESERVOIR FLUID MAPPING WHILE DRILLING ALONG HIGH-ANGLE-HORIZONTAL WELLS;** Maria Cecilia Bravo, Mirza Hassan Baig, Schlumberger; Artur Kotwicki and Nicolas Gueze, AkerBP ASA, Mathias Horstmann, Yon Blanco, Chanh Cao Minh, Julian Pop and Scott Paul, Schlumberger

4:10 **IIIII** **PSEUDO-FOCUSING PROCESSING OF ARRAY INDUCTION LOGGING MEASUREMENTS IN HIGH-ANGLE WELLS;** Hu Li, Maxwell Dynamics, Inc, Chao Yuan, Chaoliu Li, Xia Li, Cancan Zhou, PetroChina Research Institute of Petroleum Exploration & Development, John Zhou, Maxwell Dynamics, Inc.

4:30 **JJJJJ** **RESOLUTION ENHANCEMENT OF SONIC LOGS SUPPORTED BY ULTRASONIC DATA;** Jingxuan Liu, Ali Eghbali and Carlos Torres-Verdín, The University of Texas at Austin

4:50 **Closing Remarks and Door Prize Winner**

5:00 **END OF 60th ANNUAL SYMPOSIUM**