

# Short Course Program

Wettability, measurements and impacts

MONDAY, AUGUST 27, 2018

Wettability, measurements and impacts	
9:00 – 9:10	Welcome and Safety Briefing
9:10 – 9:40	1. Definition of wettability?
9:40 – 10:40	2. Classical petrophysical measurements of wettability
10:40 – 11:00	Coffee Break Kindly Sponsored by: TOTAL
11:00 – 11:25	3. Advanced measurements of wettability: NMR and dielectric
11:25 – 11:50	4. Advanced measurements of wettability: Pore scale imaging
11:50 – 12:15	5. Impact of wettability on our business
12:15 – 12:30	Closing Remarks – if necessary
12:30 – 1:30	Lunch

\*\* Kindly Sponsored By: ZEISS Microscopy

# Unconventionals, Carbonates... what core analysis can do for complex reservoirs?

## Technical Program

**Monday, August 27, 2018**

**1:30 - 1:45**            **Opening Remarks**

**1:45 – 3:15**            **Session 1: Laboratory Core Analysis #1**

**Chairs:**

- SCA001    **017** RECONSIDERING KLINKENBERG'S PERMEABILITY DATA  
Douglas Ruth and Rasoul Arabjamaloei
- SCA002    **018** VALIDATION OF PERMEABILITY AND RELATIVE PERMEABILITY DATA USING MERCURY INJECTION CAPILLARY PRESSURE DATA  
Rasoul Arabjamaloei, David Daniels, Einar Ebeltoft, Egil Boye Petersen, Richard John Pitman, Douglas Ruth
- SCA003    022 An Investigation of Three Phase Recovery Mechanisms for Oil Field Optimization by Three-Phase Core Flood and Simulation Studies  
C. Jones, J. Brodie, M. Spearing, S. Lamb, K. Sadikoglu

**3:00 – 3:15**            **Exhibitor Presentations (x5)**

**3:15 - 3:30**            **Coffee Break**  
**Kindy Sponsored by: TOTAL**

**3:30 – 3:35**            **Exhibitor Presentations (x5)**

**3:30- 5:30**            **Session 1: Laboratory Core Analysis #2**

- SCA004    **029** Determination of Electrical Parameters in Carbonates with Micro-CT, NMR and Gas Displacement Experiments  
Wang Kewen, Li Ning, Wu Hongliang, Zhang Gong, Feng Zhou, Yu jun
- SCA005    **063** INSIGHTS, TRENDS AND CHALLENGES ASSOCIATED WITH MEASURING COAL RELATIVE PERMEABILITY  
Dylan Shaw, Peyman Mostaghimi, Furqan Hussein and Ryan T. Armstrong
- SCA006    **076** DOS AND DON'TS WHEN DEVELOPING A SYSTEM TO INVESTIGATE SPONTANEOUS IMBIBITION IN UNCONSOLIDATED POROUS MEDIA  
Bergit Brattekkås, Tore L. Føyen, Trond Vabø, Håkon Haugland, Simon I. Reite, Anders S. Saunes and Martin A. Fernø
- SCA007    **081** IN SITU SATURATION MONITORING (ISSM) – RECOMMENDATIONS FOR IMPROVED PROCESSING  
Jules Reed, Arjen Cense

**5:30 - 8:00**            **Opening Reception**

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## Tuesday, August 28, 2018

**8:15 – 8:30** Exhibitor Presentations (x5)

**8:30 - 10:00** Session 2: Improved SCAL techniques and Interpretation #1

- SCA008 **009** CHARACTERIZATION OF HYSTERETIC MULTIPHASE FLOW FROM THE MM TO M SCALE IN HETEROGENEOUS ROCKS  
Samuel J. Jackson and Samuel Krevor
- SCA009 **034** Measurement of Spontaneous Imbibition Capillary Pressure, Saturation and Resistivity Index by Counter Current Technique at Net Reservoir Stress and Elevated Temperature.  
Stefano Pruno, Hans Erik Rodvelt and Ola Skjæveland
- SCA010 **043** An Investigation into Different Correlation Methods between NMR T2 Distributions and Primary Drainage Capillary Pressure Curves Using an Extensive Sandstone Database  
Adam K Moss, Tim Benson and Tony Barrow

**10:00 - 10:30** Coffee Break  
Kindly Sponsored by: Bruker microCT

**10:30 – 10:45** Exhibitor Presentations (x5)

**10:30 – 12:00** Session 2: Improved SCAL techniques and Interpretation #2

- SCA011 **044** A FAST METHOD FOR TRAPPED GAS DETERMINATION  
Pierre Faurissoux, Moeata Lutui-Tefuka, Cyril Caubit, Bruno Lalanne and Benjamin Nicot
- SCA012 **057** EXPONENTIAL CAPILLARY PRESSURE FUNCTIONS IN SEDIMENTARY ROCKS  
Armin Afrough, Mehdi Bahari Moghaddam, Laura Romero-Zerón and Bruce J. Balcom
- SCA013 **078** IMPACT OF BRINE COMPOSITION AND CONCENTRATION ON CAPILLARY PRESSURE AND RESIDUAL OIL SATURATION IN LIMESTONE CORE SAMPLES  
  
F. Feldmann, A. M. AlSumaiti, S. K. Masalmeh, W. S. AlAmeri, S. Oedai

**12:00 - 1:00** Lunch  
Kindly Sponsored by: Petricore Ltd

**1:00 – 1:15** Exhibitor Presentations (x5)

**1:00 – 2:30** Poster Session (Even Numbers)  
Chair:

**2:30 - 3:30** Coffee and Poster Session Break  
Coffee Break Kindly Sponsored by: Bruker microCT  
Poster Program Kindly Sponsored by: Premier Oilfield Group

**3:30 – 3:45**      **Exhibitor Presentations (x5)**

**3:30 – 5:00**      **Session 2: Improved SCAL techniques and Interpretation #3**

- SCA014      **080** MONITORING CORE MEASUREMENTS WITH HIGH-RESOLUTION TEMPERATURE ARRAYS  
James J. Howard and Keith C. Hester
- SCA015      **083** Obtaining High Quality SCAL Data: Combining Different Measurement Techniques, Saturation Monitoring, Numerical Interpretation and Continuous Monitoring of Experimental Data  
Yingxue Wang and Shehadeh K. Masalmeh
- SCA016      **127** IN-SITU INVESTIGATION OF AGING PROTOCOL EFFECT ON RELATIVE PERMEABILITY MEASUREMENTS USING HIGH THROUGHPUT EXPERIMENTATION METHODS  
Matthieu Mascle, Souhail Youssef, Hervé Deschamps, Olga Vizika

**5:30 – 11:00 p.m.**      **Young Professional Event**

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## Wednesday, August 29, 2018

### 9:00 – 10:00      Session 3: Wettability #1

- SCA017    **035** A REVIEW OF 60 YEARS OF NMR WETTABILITY  
Andrea Valori and Benjamin Nicot
- SCA018    **050** Spatially Resolved Wettability Measurements Using NMR Wettability Index M.J. Dick, D. Veselinovic and D. Green

### 10:00 - 10:30      Coffee Break

### 10:30 – 12:00      Session 3: Wettability #2

- SCA019    **085** THE ROLE OF FERROUS CLAYS IN THE INTERPRETATION OF WETTABILITY – A CASE STUDY  
Velazco M.A, Bruce A., Ferris M, Reed J., Kandasamy R.
- SCA020    **117** A LABORATORY SCALE APPROACH TO WETTABILITY RESTORATION IN CHALK CORE SAMPLES  
Jaspreet S. Sachdeva, Edison A. Sripal, Anders Neramoen, Reidar I. Korsnes, Merete V. Madland, Lesley A. James
- SCA021    **118** TOWARD A MECHANISTIC UNDERSTANDING OF WETTABILITY ALTERATION IN RESERVOIR ROCKS USING SILICA NANOPARTICLES  
Saeed Jafari Daghlian Sofla, Lesley Anne James , Yahui Zhang

### 12:00 - 1:00      Lunch

### 1:00 – 1:50      Session 4: Unconventionals and Shales #1

- SCA022    **059** LINKS BETWEEN GEOCHEMISTRY, TOTAL ORGANIC CARBON, MAGNETIC PROPERTIES AND ANISOTROPY IN SHALE CORE SAMPLES FROM THE HORN RIVER GROUP, BRITISH COLUMBIA, CANADA  
Vivian T. Ebufegha and David K. Potter
- SCA023    **093** LOADING EFFECTS ON GAS RELATIVE PERMEABILITY OF A LOW PERMEABLE SANDSTONE  
F. Agostini<sup>1</sup>, P. Egermann<sup>2</sup>, L. Jeannin<sup>2</sup>, E. Portier<sup>3</sup>, F. Skoczylas<sup>1</sup>, Y. Wang<sup>1</sup>

### 1:50 – 3:00      Poster Session (Odd Numbers)

### 3:00 – 4:00      Coffee and Poster Session Break

### 4:00 - 4:50      Session 4: Unconventionals and Shales #2

- SCA024    **114** A FIRST STEP IN EVALUATING THE ROLE OF DIFFUSION IN EOR IN TIGHT SHALE FORMATIONS  
Son T. Dang, Carl H. Sondergeld, Chandra S. Rai, Ali O. Tinni, Nicolas Drenzek

SCA025 **116** Monitoring Gas Hydrate Formation with Magnetic Resonance Imaging in a Metallic Core Holder  
Mojtaba Shakerian, Armin Afrough, Sarah Vashae, Florin Marica, Yuechao Zhao, Jiafei Zhao, Yongchen Song and Bruce J. Balcom

**5:30 – 11:00**

**Gala Dinner**

**Kindly Sponsored by: Thermo Fisher Scientific**

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## Thursday, August 30, 2018

**8:00 - 9:45**                      **Session 5: Displacement Mechanisms / EOR #1**

- SCA026      **001** RHEOLOGY-BASED METHOD FOR CALCULATING POLYMER INACCESSIBLE PORE VOLUME IN CORE FLOODING EXPERIMENTS  
Ferreira, V. H. S. and Moreno, R. B. Z. L.
- SCA027      **012** Impact of injection rate on transient oil recovery under mixed-wet conditions: a microfluidic study  
Magali Christensen, Xanat Zacarias-Hernandez, Yukie Tanino
- SCA028      **054** EFFECTS OF IONS ON THE CHARACTERISTICS OF MONOLAYER AT BRINE/OIL INTERFACES  
Mohammed B. Alotaibi, Dongkyu Cha, Karam Chand and Ali A. Yousef

**9:45 - 10:15**                      **Coffee Break**

**10:15 – 11:30**                      **Session 5: Displacement Mechanisms / EOR #2**

- SCA029      **087** A novel experimental approach for studying spontaneous imbibition processes with alkaline solutions.  
T. Chevalier, J. Labaume, A. Delbos, T. Clemens, V. M. Waeger, B. Bourbiaux, M. Fleury
- SCA030      **125** REVIEW OF THE INTERCEPT METHOD FOR RELATIVE PERMEABILITY CORRECTION USING A VARIETY OF CASE STUDY DATA  
Jules Reed, Jos Maas
- SCA031      **074** CO<sub>2</sub>-BRINE INJECTIVITY TESTS IN HIGH CO<sub>2</sub> CONTENT CARBONATE FIELD, SARAWAK BASIN, OFFSHORE EAST MALAYSIA  
A Giwelli, MZ Kashim, MB Clennell, L Esteban, R Noble, C White, S Vialle, M Ghasemizarani, M Myers, A Saeedi, S Salwani Md Shah

**11:30 – 12:00**                      **Business Meeting**

**12:00 - 1:00**                      **Lunch**

**1:00 – 2:40**

**Session 6: Pore Scale Imaging and Modeling #1**

SCA032 **041** A NEW WATERFLOOD INITIALIZATION PROTOCOL FOR PORE-SCALE MULTIPHASE FLOW EXPERIMENTS

Q. Lin, B. Bijeljic, S. C. Krevor, M. J. Blunt, S. Berg, A. Coorn, H. van der Linde, A. Georgiadis, O. B. Wilson

SCA033 **072** ADDED INSIGHT FROM IMAGE-BASED WETTABILITY CHARACTERIZATION

Rudolf Held, Norbert Schleifer, Luis Genolet, Andrew Fogden

SCA034 **095** UNCERTAINTY QUANTIFICATION IN IMAGE SEGMENTATION FOR IMAGE-BASED ROCK PHYSICS IN A SHALY-SANDSTONE

James Howard, Sam Lin, Shawn Zhang

**2:40 – 3:10**

**Coffee Break**

**3:10 - 4:00**

**Session 6: Pore Scale Imaging and Modeling #2**

SCA035 **124** A DIGITAL ROCK PHYSICS APPROACH TO EFFECTIVE AND TOTAL POROSITY FOR COMPLEX CARBONATES: PORE-TYPING AND APPLICATIONS TO ELECTRICAL CONDUCTIVITY

Christoph H. Arns, Han Jiang, Hongyi Dai, Igor Shikhov, Nawaf Sayedakram, and Ji-Youn Arns

SCA036 **126** CAPILLARY DESATURATION CURVES AND INSIGHTS ON TRAPPED OIL AT THE PORE SCALE, IN WATER-WET AND OIL-WET SANDSTONES

Hélène Berthet, Mathilde Hebert, Prisca Andriamananjaona, Sandra Barbouteau, Remi Farwati, Redouane Meftah, Gerard Quenault, Jean-Philippe Chaulet, Regis Brugidou, and Richard Rivenq

**4:05**

**Closing Remarks**



## Posters

SCA037	002 NON-DESTRUCTIVE PORE-SCALE APPROACH TO EVALUATE ELASTIC PROPERTIES OF SHALE SAMPLES BY IMAGING, MODELING AND SIMULATION Weifeng Lv, Langqiu Flora Sun
SCA038	006 ROCK ELECTRICAL PROPERTIES FROM POROUS PLATE AND RESISTIVITY EXPERIMENTS: TIPS TO MAXIMIZE DATA QUALITY F. Pairoys
SCA039	008 INSIGHTS INTO LOW SALINITY WATER FLOODING Hasan N. Al-Saedi; Ralph E. Flori; Patrick V. Brady
SCA040	011 RESIDUAL OIL SATURATION UNDER MIXED-WET CONDITIONS: OPTIMAL WETTABILITY REVISITED Magali Christensen, Yukie Tanino
SCA041	014 A NEW CHEMICAL REMEDIATION PRODUCT TO PREVENT SAND PRODUCTION FROM UNCONSOLIDATED POROUS MEDIA B. Marchand, C. A. Davy, F. Agostini, F. Skoczylas, A. Lange, L. Jeannin, P. Egermann
SCA042	015 MEASUREMENT OF THE ORGANIC SATURATION AND ORGANIC POROSITY IN SHALE Qian Sang, Shaojie Zhang, Yajun Li, Mingzhe Dong Steven Bryantb
SCA043	016 FORMATION DAMAGE IN THE INTER-WELL ZONES: EXPERIMENTS AND ADVANCED ANALYTICS Denis Orlov, Dmitry Koroteev
SCA044	019 CONTINUOUS CORE MEASUREMENTS: APPLICATIONS FOR OPTIMIZED PETROPHYSICAL AND GEOMECHANICAL MODELLING IN SNE FIELD, SENEGAL. C. Germay, T. Lhomme, C. McPhee, Mike Starcher
SCA045	025 NUMERICAL SIMULATION OF NANOFUID INJECTION IN OIL SATURATED POROUS MEDIA WITH ENVIRONMENTAL APPLICATIONS Alexandra Sikinioti-Lock, Katerina Terzi, Maria Theodoropoulou, Christos Tsakiroglou
SCA046	026 A METHODOLOGY TO PREDICT THE GAS PERMEABILITY PARAMETERS OF TIGHT RESERVOIRS FROM NITROGEN SORPTION ISOTHERMS AND MERCURY POROSIMETRY CURVES Christos D. Tsakiroglou, Adnan Al Hinai, Reza Rezaee
SCA047	032 AVOIDING ROUTINE CORE ANALYSIS PLUG DAMAGE BY PROPER EVALUATION OF CORE GAMMA-RAY, CORE DESCRIPTION AND WELLSITE CORE SAMPLING Norbert Schleifer, Emmanuel Kesse and George Lawrence
SCA048	033 LIQUID VAPOR ISOTHERMS IN NANO-POROUS MEDIA UNDER NMR OBSERVATION Aleksandr Denisenko
SCA049	036 X-RAY COMPUTED TOMOGRAPHY SUPPORTED BY NUCLEAR MAGNETIC RESONANCE AND MERCURY POROSIMETRY AS NOVEL APPROACH IN PORE SPACE CHARACTERIZATION OF TIGHT SANDSTONES Krakowska P., Puskarczyk E., Jędrychowski M., Habrat M., Madejski P., Dohnalik M
SCA050	039 CORE-FLOODS ON SITE: ASSESSING THE OPTIONS FOR WATER TREATMENT IN FIELDS WITH ACTIVE EOR APPLICATIONS T. Gumpenberger, P. Toplack, Ch. Pripfl, W. Vollnhofer, Ch. Einzinger, M. Marx and R. Grillneder

SCA051	040 AN EXPERIMENTAL SETUP FOR THE ASSESSMENT OF EFFECTS OF CARBONATE ROCK DISSOLUTION ON COMPLEX ELECTRICAL CONDUCTIVITY SPECTRA Matthias Halisch, Sarah Hupfer, Andreas Weller, Raphael Dlugosch, Hans-Peter Plumhoff
SCA052	045 HIGH FIELD MRI OF HYDRATE PHASE TRANSITIONS IN SANDSTONE S. Almenningen, J. Gauteplass, V.F. Veland, G.L. Aastveit, P. Fotland, and G. Ersland
SCA053	047 CHARACTERIZATION OF FLUID-ROCK INTERACTION BY ADSORPTION CALORIMETRY D. Korobkov, V. Pletneva, E. Dyshlyuk
SCA054	049 MEASURING RELATIVE PERMEABILITY WITH NMR M.J. Dick, D. Veselinovic, T. Kenney and D. Green
SCA055	051 SUPERCRITICAL METHANE DIFFUSIVITY IN POROUS MEDIA Nicholas J. Drenzek, Prem K. Bikkina, Jarred H. Kelsey, Clint P. Aichele, Jeffery L. White
SCA056	056 OVERVIEW OF THE LET FAMILY OF VERSATILE CORRELATIONS FOR FLOW FUNCTIONS Frode Lomeland
SCA057	060 PROBE MAGNETICS AS A RAPID, NON-DESTRUCTIVE SCREENING TOOL FOR CONSOLIDATED AND UNCONSOLIDATED CORE IN CONVENTIONAL AND UNCONVENTIONAL RESERVOIRS Toan H. To, David K. Potter, Aminat Abiola, and Vivian T. Ebufegha
SCA058	064 DYNAMIC ADSORPTION-DIFFUSION MODEL FOR SIMULATING GAS PRODUCTION IN SHALE Zehao Yang, Qian Sang, Yajun Li, Steven Bryant, Mingzhe Dong
SCA059	065 TOPOLOGICAL PERSISTENCE OF HETEROGENEOUS SANDSTONE Anna L Herring, Vanessa Robins, Mohammad Saadatfar, BenjaminYoung, Mark Knackstedt, Adrian Sheppard
SCA060	066 UNIVERSAL, FLOW DEPENDENT RELATIVE PERMEABILITY SCALING FOR STEADY-STATE TWO-PHASE FLOWS IN POROUS MEDIA Marios S. Valavanides
SCA061	068 EXPERIMENTAL INVESTIGATION OF STABILITY OF SILICA NANOPARTICLES AT RESERVOIR CONDITIONS FOR ENHANCED OIL RECOVERY APPLICATIONS Shidong Li, Nanji J. Hadia, Ng Yeap Hung, Hon Chung Lau, Ole Torsæter, Ludger P. Stubbs
SCA062	075 INVESTIGATION OF THE EFFECT OF TEMPERATURE AND PRESSURE ON INTERFACIAL TENSION AND WETTABILITY Taha M. Okasha
SCA063	096 INFLUENCE OF ASPECT RATIO AND WETTABILITY ON RESIDUAL OIL SATURATIONS AFTER WATERFLOODING AND IMMISCIBLE GAS FLOODING: A MICROFLUIDICS BASED STUDY  SUSHOBHAN PRADHAN, GBEU KONE, RYAN ANTLE, CLINT AICHELE, HAIFENG JIANG AND PREM BIKKINA
SCA064	101 STUDY OF THE SULPHATE ION EFFECT ON OIL RECOVERY DURING LOW SALINITY WATER INJECTION IN DOLOMITES  GUILHERME BUENO AQUINO DE OLIVEIRA, EDDY RUIDIAZ MUÑOZ, ALESSANDRA WINTER, OSVAIR VIDAL TREVISAN
SCA065	105 CHARACTERISTICS OF CARBONATE ROCK TYPES IN THE MIDDLE EAST  MOUSTAFA DERNAIKA, BASHAR MANSOUR, OSAMA AL JALLAD

SCA066	113 CONTINUOUS VS DISCONTINUOUS CAPILLARY DESATURATION AND IMPLICATIONS FOR IOR/EOR  RUI XU, BERND CROUSE, DAVID M. FREED, ANDREW FAGER, GARY R. JERAULD, NATHAN LANE, QIANG SHENG,
SCA067	123 TAXONOMY OF STEADY-STATE TWO-PHASE FLOWS IN POROUS MEDIA  MARIOS S. VALAVANIDES