Optimize Your Unconventional Resource Plays
Continuous real-time monitoring and analysis of complex unconventional well dynamics

Replace guesswork with high fidelity data.

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**ENDORsing ORGANIZATIONS:**

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proud sponsor of URTeC 2021
Dear Friends,

Welcome to URTeC 2021. Whether you’re reading this letter in the printed program guide or as a PDF online, we’re very happy to have you with us. Our hybrid event will mark the first time many of us will be together in-person since the close of URTeC 2019 – nearly two years ago. And while we’re thrilled to be delivering great content and networking both in Houston and online, we’re particularly excited about getting back to business, greeting old friends, and catching up on our experiences in the session rooms, exhibit hall, hotels, and area restaurants.

The program this year is as diverse and strong as ever. In fact, the hybrid format allowed our theme committees to select and retain the highest scoring talks regardless of a speaker’s ability to travel. This means you’ll experience and have access to more than 250 presentations focused on collaboration and integration between the subsurface G&G disciplines, geomechanics, formation evaluation, wellhead design, completion design, enhanced recovery, production forecasting and the environmental, social, and corporate governance factors that will help you achieve long-term success.

The exhibition is strong with 140+ companies in the convention center and online – featuring the latest in technology and services to help you safely produce more for less with an eye to environmental stewardship. The new online platform – accessible to all conference registrants – includes enhanced options to request meetings and personal demos whether you’re in the exhibit hall or in the office. Be sure to create a personal profile and use the platform for maximum benefit. In addition, a mix of topical breakfast and lunch talks will be available whether you eat at your desk or want to grab a bite between sessions at the Brown.

We should note that URTeC will occupy a new space in the calendar in 2022 – 20–22 June in Houston. As you know, the industry’s events schedule has changed significantly post-covid and the new timing will help us avoid conflicts with other important events. Please mark the dates and plan to speak and/or attend.

URTeC is a forum where pros engaged in all aspects of the E&P lifecycle come together to innovate, integrate, and advance understanding to create value. This conference remains the best opportunity you’ll have to exchange information, formulate strategic ideas, and solve problems to manage and optimize your unconventional resource plays.

Thank you for attending. We hope you’ll enjoy the conference – whether onsite or online.

Sincerely,

Technical Program Co-Chairs

Jay Stratton (SPE)  
Ultra Petroleum

Stephanie Perry (AAPG)  
GeoMark Research Ltd.

Scott Singleton (SEG)  
Independence Resources Management

Johannes Alvarez  
(SPE Elect)  
Chevron
THEME CHAIRS

Robert Hurt, Pioneer Natural Resources, Theme 5: Geomechanics – The Intersection of Geoscience and Engineering
Ahmad Ghassemi, University of Oklahoma, Theme 5: Geomechanics – The Intersection of Geoscience and Engineering
Laurent Louis, NER, Theme 5: Geomechanics – The Intersection of Geoscience and Engineering
Chris Ginn, Oxy, Theme 5: Geomechanics – The Intersection of Geoscience and Engineering
John Curtis, GeoMark Research Ltd., Theme 6: Applied Geochemistry for Unconventionals: From Source Rock to Produced Hydrocarbons
Eric Michael, ConocoPhillips, Theme 6: Applied Geochemistry for Unconventionals: From Source Rock to Produced Hydrocarbons
Jason Jweda, ConocoPhillips, Theme 6: Applied Geochemistry for Unconventionals: From Source Rock to Produced Hydrocarbons
Craig Barrie, GeoMark Research, Theme 6: Applied Geochemistry for Unconventionals: From Source Rock to Produced Hydrocarbons
Birol Dindoruk, University of Houston, Theme 7: Machine Learning, AI and Big Data in the Digital Oilfield
Mariano Gurfinkel, Marathon Oil, Theme 7: Machine Learning, AI and Big Data in the Digital Oilfield
George Koperna, Advanced Resources International, Inc., Theme 8: Unlocking the Production and Recovery Potential of Unconventionals
Autumn Shannon, Marathon Oil, Theme 8: Unlocking the Production and Recovery Potential of Unconventionals
Hosein Kalaei, ConocoPhillips, Theme 8: Unlocking the Production and Recovery Potential of Unconventionals
Didi Ooi, Oxy, Theme 8: Unlocking the Production and Recovery Potential of Unconventionals

SUBCOMMITTEE CHAIRS

Brian Driskill, Shell, Panels and Invited Sessions
Kanay Jerath, Oxy, Panels and Invited Sessions
Chris Ginn, Oxy, Panels and Invited Sessions
Stephanie Perry, GeoMark Research Ltd., Topical Breakfasts and Luncheons
Diego Molinari, Xacta Digital Labs, Topical Breakfasts and Luncheons
Liang Xu, Evonik, Topical Breakfasts and Luncheons
Rex Griffin, UP Energy, Technology Committee
Alexandra Martinez, DeGolyer and MacNaughton, Technology Committee

Rick Walker, Retired, Technology Committee
Ali Sloan, Parsley Energy, Core Workshop
David Livasy, Parsley Energy, Core Workshop
Barbara Hill, Schlumberger, Core Workshop
Dawn Hayes, Consulting, Core Workshop
ON-SITE REGISTRATION
Location: Exhibit Hall D (Street Level)
Saturday .......................................... 12:00 pm–5:00 pm
Sunday ........................................... 9:00 am–5:00 pm
Monday ........................................... 6:30 am–5:30 pm
Tuesday ........................................... 6:30 am–5:30 pm
Wednesday ..................................... 6:30 am–1:00 pm

EXHIBITION HALL HOURS
Location: Exhibit Hall E
Monday ........................................... 10:00 am–6:00 pm
Tuesday .......................................... 9:00 am–6:00 pm
Wednesday ........................................ 9:00 am–1:00 pm

SPEAKER SERVICE CENTER
Location: Room 350 D/E
Sunday ........................................... 12:00 pm–5:00 pm
Monday ........................................... 7:00 am–5:00 pm
Tuesday .......................................... 7:00 am–5:00 pm
Wednesday ..................................... 7:00 am–4:00 pm

FIRST AID
Location: Hall E Lobby
Saturday .......................................... 9:00 am–5:00 pm
Sunday ........................................... 9:00 am–6:00 pm
Monday ........................................... 7:00 am–7:00 pm
Tuesday .......................................... 7:00 am–7:00 pm
Wednesday ..................................... 7:00 am–1:00 pm

LUGGAGE CHECK
Location: Near Registration in Exhibit Hall D
Wednesday ..................................... 7:00 am – 5:30 pm
Items checked will be at $5.00 per item.

FedEx OFFICE
Location: Mezzanine Level 2
Days: Monday–Friday
Hours: 8:00 am–5:00 pm
From packing and shipping to signage, copying and last-minute office supplies, the FedEx Office Print & Ship Center offers virtually everything you require to meet your needs. For further information, contact 713 658 1899 or usa5000@fedex.com.

LOST AND FOUND
Location: Registration, Exhibit Hall D
Items found during the conference should be turned in to URTeC Show Management personnel, location in Registration. If your lost items have not been turned in, you can leave contact information at Registration.

SOCIAL MEDIA
Make sure to follow URTeC on Facebook, Twitter, and LinkedIn to stay connected and to get the latest updates on what’s happening during the event. Use #URTeC2021 to join the discussion online.

Download the URTeC 2021 App
Available for both iOS and Android devices, the URTeC 2021 App provides you with all the vital conference information in the palm of your hand. Download for free today.

NO-ELECTRONIC CAPTURING POLICY
Capturing or photographing contents of Exhibit Displays, Technical Sessions, or Exhibit Hall Technical Sessions is strictly prohibited.

NO SMOKING POLICY
Smoking is prohibited at the George R. Brown Convention Center.

CODE OF CONDUCT
The Unconventional Resources Technology Conference (URTeC) is conducted for the benefit of its members and interested parties to advance the science of geology, geophysics, and engineering, to promote technology, and facilitate networking and collaboration between professionals. URTeC values the participation of its members and guests and wants all URTeC attendees to have an enjoyable and fulfilling experience.

Accordingly, URTeC is dedicated to providing a harassment-free conference experience for everyone, regardless of gender, sexual orientation, disability, physical appearance, body size, race, or religion. We do not tolerate harassment of conference participants in any form. All attendees are expected to show respect and courtesy to other attendees throughout the conference and at all conference events, whether officially sponsored by URTeC or not.

If a participant engages in behavior that violates this code of conduct, URTeC reserves the right to take any action deemed appropriate, including warning the offender(s) or expelling the offender(s) from the convention with no refund. URTeC’s complete URTeC anti-harassment policy can be found at URTeC.org/2021/Code-of-Conduct.

Reporting
If you have questions or concerns, please notify a badged URTeC staff member or call +1 800 898 2274. You can communicate with us anonymously at www.urtec.org/carereport
Login Information
URTeC 2021 attendees are welcomed and encouraged to login use the online digital platform to view all sessions, presentations, exhibitor/sponsor information, and to connect with your fellow colleagues and business relationships.

Please note, your unique access link to the online digital platform will be emailed to you three days before the start of the event. You will need to retain this email to access the platform. Take time now to log in using your unique link to ensure you have no issues entering the event and to familiarize yourself with the platform features.

On-Demand Content
As an added benefit to URTeC 2021, all content on the online digital platform will be accessible for 30 days after the event through 27 August 2021.

Connect with Exhibitors and Sponsors
Get in touch with exhibitors and sponsors to connect now.
- View company profiles
- Download brochures, videos, and files from exhibitors/sponsors
- Visit company webpages and social media accounts
- Live video chat with exhibitor and sponsor staff
- Schedule meetings and appointments with company representatives throughout the conference

Play Now – 6 Chances to Win
Attendees collect the codes and win big. By playing this Code Collection Game you’ll have the chance to win six $100 Amazon Gift Cards. We will have two gift card drawings each day of the event. Don’t miss this opportunity to grab these great prizes.

Here’s How to Play:
- Step 1: Log into the URTeC Online Digital Platform
- Step 2: Navigate to the Lobby and look for Collect Codes & Win a Prize.
- Step 3: Start exploring to uncover the hidden codes. All the codes you’re looking for can be found in the Exhibitor Booths of the online platform.
- Step 4: Collect the codes and complete the submission form.
- Step 5: Submit your findings.

Need Help?
If you have any questions, concerns, or issues logging into the online digital platform, please contact: helpdesk@sw-online.com.

Unconventional Resource Technologies to Optimize Your Unconventional Plays
We cover the crucial elements for your unconventional plays—digital solutions, sustainability, and technology. Don’t miss out!

Booth 4521

slb.com
### Conference at a Glance (As of 15 July)

#### Saturday
- **8:00 am–5:00 pm** Short Course 1: Principles of Energy Storage and Carbon Capture Storage and Utilization (AAPG) *
- **8:00 am–5:00 pm** Short Course 5 (Day 1): Petrophysics and Geophysics Relevant to CO₂ Enhanced Oil Recovery (SEG)
- **8:00 am–5:00 pm** Short Course 6 (Day 1): The Geology of Unconventional Reservoirs (SEG) *
- **8:00 am–5:00 pm** Short Course 7 (Day 1): Understanding Signals: Basic Waveform Analysis from a Geophysical Perspective (SEG) *
- **12:00 pm–5:00 pm** Registration

#### Sunday
- **8:00 am–5:00 pm** Short Course 5 (Day 2): Petrophysics and Geophysics Relevant to CO₂ Enhanced Oil Recovery (SEG)
- **8:00 am–5:00 pm** Short Course 6 (Day 2): The Geology of Unconventional Reservoirs (SEG) *
- **8:00 am–5:00 pm** Short Course 7 (Day 2): Understanding Signals: Basic Waveform Analysis from a Geophysical Perspective (SEG) *
- **9:00 am–5:00 pm** Registration

#### Monday
- **6:30 am–5:30 pm** Registration
- **8:25 am–10:05 am** Opening Plenary Session: Unconventionals in Transition
- **10:00 am–6:00 pm** Exhibition
- **10:45 am–12:05 pm** Panel Session: The Road Ahead for New Technology Now: Funding and Commercialization
- **10:45 am–12:05 pm** Special Session: Hydraulic Fracturing Test Site-2 Part I
- **10:45 am–12:05 pm** Special Session: ConocoPhillips Unconventional Reservoirs and Technology Showcase
- **10:45 am–5:30 pm** Technical Sessions – In-Person
- **10:45 am–5:30 pm** Technical Sessions – Online *
- **12:15 pm–1:30 pm** Topical Luncheon: Future of Unconventionals – Geoscience and Engineering Aspects
- **12:15 pm–1:30 pm** Topical Luncheon: Energy 4.0: How to Design a Future-Proof Digital Asset that Hits the Financial Bottomline *
- **12:15 pm–1:30 pm** Topical Luncheon: ESG: A Different Take *
- **12:15 pm–1:30 pm** Topical Luncheon: Exploration and Inventory Assessment in the Age of Capital Efficiency and Free Cash Flow
- **1:45 pm–3:25 pm** Panel Session: Learning From Other Industries: A Geothermal Conversation
- **1:45 pm–3:30 pm** Special Session: EOR: Best of Tulsa – Recovery Improvement of Unconventional/Tight Systems
- **1:45 pm–3:30 pm** Special Session: ConocoPhillips: Optimizing Through Completion Design and Production Analysis
- **1:45 pm–5:25 pm** Technical Sessions – In-Person
- **3:00 pm–4:00 pm** Refreshment Break
- **4:05 pm–5:25 pm** Panel Session: Supply Chains in Energy: Cost Savings, Quality Assurance, 3-D Printing, Ethical Sourcing
- **5:00 pm–6:00 pm** Networking Reception

#### Tuesday
- **6:30 am–5:30 pm** Registration
- **7:00 am–8:15 am** Topical Breakfast: Practical Aspects of Core/Log Integration in Organic Mudstones
- **7:00 am–8:15 am** Topical Breakfast: Charting a Course – Oilfield Services, Technologies, Trends, and the Impact on Domestic Producers
- **7:00 am–8:15 am** Topical Breakfast: PE Opportunity Space in Upstream, Midstream, and Renewables and What Critical Assessments You Look for or Target for Possible Investment and Why
- **8:25 am–10:05 am** Panel Session: ESG in Action: Flare Reduction, Leak Detection, Logistics, Blended Solar / Geothermal / Wind Electricity Generation Projects, Social License to Operate
- **8:25 am–10:10 am** Special Session: Hydraulic Fracturing Test Site-2 Part IV
- **8:25 am–10:10 am** Special Session: Best of ARMA
- **8:25 am–11:40 am** Technical Sessions – In-Person
- **8:25 am–5:30 pm** Technical Sessions – Online *
- **9:00 am–6:00 pm** Exhibition
- **10:00 am–11:00 am** Refreshment Break
- **10:45 am–12:05 pm** Panel Session: Sensors, Automation, and Smart Digital Operations: Where We are and the Road Ahead
- **10:45 am–12:05 pm** Special Session: Hydraulic Fracturing Test Site-2 Part V
- **12:15 pm–1:30 pm** Topical Luncheon: Future of Unconventionals – Geoscience and Engineering Aspects
- **12:15 pm–1:30 pm** Topical Luncheon: Energy 4.0: How to Design a Future-Proof Digital Asset that Hits the Financial Bottomline *
- **12:15 pm–1:30 pm** Topical Luncheon: ESG: A Different Take *
- **12:15 pm–1:30 pm** Topical Luncheon: Exploration and Inventory Assessment in the Age of Capital Efficiency and Free Cash Flow
- **1:45 pm–3:25 pm** Panel Session: Learning From Other Industries: A Geothermal Conversation
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- **1:45 pm–3:30 pm** Special Session: ConocoPhillips: Optimizing Through Completion Design and Production Analysis
- **1:45 pm–5:25 pm** Technical Sessions – In-Person
- **3:00 pm–4:00 pm** Refreshment Break
- **4:05 pm–5:25 pm** Panel Session: Supply Chains in Energy: Cost Savings, Quality Assurance, 3-D Printing, Ethical Sourcing
- **5:00 pm–6:00 pm** Networking Reception

* = Online only
### WEDNESDAY

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<tbody>
<tr>
<td>6:30 am–1:00 pm</td>
<td>Registration</td>
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<tr>
<td>7:00 am–8:15 am</td>
<td>Topical Breakfast: Investigation of Multiple Formations in the Midcontinent for CO₂ Storage Potential Through the Acquisition and Analysis of over 700 ft of Whole Core</td>
</tr>
<tr>
<td>7:00 am–8:15 am</td>
<td>Topical Breakfast: The Great Transition?</td>
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<tr>
<td>7:00 am–8:15 am</td>
<td>Topical Breakfast: Present and Future Technological Challenges in the Formation Evaluation of Unconventional Sources of Subsurface Energy</td>
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<tr>
<td>7:00 am–8:15 am</td>
<td>Topical Breakfast: Hess In The Bakken: Lean and Innovation Driving the Next Stage of Development</td>
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<tr>
<td>8:25 am–10:05 am</td>
<td>Panel Session: Assessing Risk and Evaluating Opportunities from Different Perspectives</td>
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<tr>
<td>8:25 am–10:10 am</td>
<td>Special Session: DOE Fundamental Shale Research Program I</td>
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<tr>
<td>8:25 am–10:15 am</td>
<td>Special Session: Best of URTeC Latin America I</td>
</tr>
<tr>
<td>8:25 am–12:05 pm</td>
<td>Technical Sessions – In-Person</td>
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<tr>
<td>9:00 am–1:00 pm</td>
<td>Exhibition</td>
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<tr>
<td>10:00 am–11:00 am</td>
<td>Refreshment Break</td>
</tr>
<tr>
<td>10:45 am–12:05 pm</td>
<td>Panel Session: Earth's Surface Imaging for Pivoting: Affordable Drones and Satellite Imaging for Geological Exploration and Operations, Environmental Monitoring and Energy Utilization</td>
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<tr>
<td>10:45 am–12:05 pm</td>
<td>Special Session: DOE Fundamental Shale Research Program II</td>
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<tr>
<td>10:45 am–12:15 pm</td>
<td>Special Session: Best of URTeC Latin America II</td>
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<tr>
<td>10:45 am–12:15 pm</td>
<td>Technical Sessions – Online *</td>
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<tr>
<td>12:15 pm–1:30 pm</td>
<td>Topical Luncheon: Promoting Cased Hole Formation Evaluation (CHFE) as an Alternative to Openhole Logging for Completion Design in Horizontal Wells</td>
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<td>12:15 pm–1:30 pm</td>
<td>Topical Luncheon: Casing Damage and Hydraulic Fracturing: Geomechanical Perspectives</td>
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<tr>
<td>12:15 pm–1:30 pm</td>
<td>Topical Luncheon: B Minus – Must Try Harder: Some Thoughts on the Current State of the Art in Unconventional Play and Reservoir Evaluation</td>
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<tr>
<td>12:15 pm–1:30 pm</td>
<td>Topical Luncheon: BPX Energy: Technical Evolution Through Applied Physical Analytics</td>
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<tr>
<td>1:45 pm–3:25 pm</td>
<td>Panel Session: The New Way to Work: Digital Platforms, Cloud-Based Collaborations, and Ecosystems</td>
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<tr>
<td>1:45 pm–3:30 pm</td>
<td>Special Session: Best of SPWLA</td>
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<tr>
<td>1:45 pm–3:30 pm</td>
<td>Special Session: Carbon Capture, Utilization, and Storage (CCUS) I *</td>
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<tr>
<td>1:45 pm–5:10 pm</td>
<td>Technical Sessions – In-Person</td>
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<tr>
<td>3:30 pm–3:50 pm</td>
<td>Refreshment Break</td>
</tr>
<tr>
<td>3:50 pm–5:10 pm</td>
<td>Panel Session: Global Unconventional</td>
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<tr>
<td>3:50 pm–5:30 pm</td>
<td>Special Session: Carbon Capture, Utilization, and Storage (CCUS) II *</td>
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### THURSDAY

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<tbody>
<tr>
<td>8:00 am–5:00 pm</td>
<td>Short Course 13: Methane Emission Measurement and Mitigation (MEMM) (SPE) *</td>
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<tr>
<td>8:00 am–5:00 pm</td>
<td>Short Course 16 (Day 1): Gas EOR in Tight Unconventionals (SPE) *</td>
</tr>
<tr>
<td>8:00 am–5:00 pm</td>
<td>Short Course 17 (Day 1): Reservoir Engineering Applications of Advanced Data Analytics and Machine Learning Algorithms (SPE) *</td>
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### FRIDAY

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<tr>
<td>8:00 am–5:00 pm</td>
<td>Short Course 16 (Day 2): Gas EOR in Tight Unconventionals (SPE) *</td>
</tr>
<tr>
<td>8:00 am–5:00 pm</td>
<td>Short Course 17 (Day 2): Reservoir Engineering Applications of Advanced Data Analytics and Machine Learning Algorithms (SPE) *</td>
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</tbody>
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Purchase your Topical Breakfast and Luncheon tickets at registration.
Tickets are limited and required for admission.

* = Online only
CONFERENCE HIGHLIGHTS

- MONDAY
- TUESDAY
- WEDNESDAY
- NETWORKING OPPORTUNITIES
- SHORT COURSES
Unconventionals in Transition

Time: 8:25 am–10:05 am
Location: In-Person – George R. Brown Convention Center, General Assembly
Co-Chairs: Skip Rhodes and Doug Valleau

The 2020 pandemic combined with production quota volatility and demand for free cash flow generation created a perfect storm for the unconventional sector. As the industry recovers, the next five years offers something for both the pessimist and the optimist. This ninth offering of URTeC opens with a distinguished group of plenary speakers to help illuminate the drivers that will affect this era of transition.

The vision for unconventionals will be about developing technology and a culture to support a sustainable energy future globally. The challenge facing operators is how to keep providing affordable energy at a reasonable return while transitioning their business to meet the demands of a carbon-neutral future. Investors and shareholders are voicing expectations regarding demonstrable commitment to a broad spectrum of Environmental, Social, and Corporate Governance (ESG) issues. For traditional energy companies, the importance of (ESG), combined with implementation of technology and innovation that reduce greenhouse gases are key factors that will shape oil market investment and outcomes in 2021 and beyond. To implement this vision requires engagement by the brightest talent and an adventurous workforce to level the hurdles and deliver at or above expectations. During this URTeC program, you will gain additional insight and even some possible solutions to the challenges of Unconventionals in Transition.

Speakers:
- Occidental’s Path to Carbon Neutrality
  Vicki Hollub, President and Chief Executive Officer, Occidental
- Social Engineering Meets Petroleum Engineering – Goals Versus Realities for Today’s Energy Sector
  Bob Brackett, Senior Vice President and Senior Research Analyst, Sanford C. Bernstein
- The Real Global Energy Transition: From Poverty to Prosperity
  Scott W. Tinker, Director, Bureau of Economic Geology, State Geologists of Texas; Professor, Edwin Allday Endowed Chair in Subsurface Geology, Jackson School
- Outrun the ESG Bear or Just the Company Next to You?
  Jeremy Sweek, Co-Founder and Managing Partner, Darcy Partners

The Road Ahead for New Technology Now: Funding and Commercialization

Time: 10:45 am–12:05 pm
Location: In-Person – George R. Brown Convention Center, General Assembly
Moderator: Susan Nash

How have technology needs changed in response to low price and operating environments? Where are investment, early stage adoption, and commercialization efforts going? What have we learned and where are we going? This panel looks at technology, finance, and strategic factors and case studies.

Panelists:
- John Thurmond, Principal Advisor – Geoscience (Emerging Technology), Hess
- Taha Hussain, Venture Partner, Delek US
- Stuart Coleman, Venture Principal, Chevron
- Sudhir Pai, Director, Technology Collaboration Center

Implementing New Technologies in the Field: How Companies are Approaching it in 2021 and Beyond

Time: 1:45 pm–3:30 pm
Location: In-Person – George R. Brown Convention Center, General Assembly
Moderator: Amit Singh

Panelists evaluate the processes by which companies scout, evaluate, and test technologies in operations and the field.

Panelists:
- Amy Henry, Chief Executive Officer, Eunike Ventures
- Scott Neal, Director / Tight Assets, Chevron
- Sunil Garg, Chief Executive Officer, DataVedik
- Shunhua Liu, Director, Unconventional Engineering Technology, Oxy

Data Issues: Management, Integrity, Legacy

Time: 4:05 pm–5:25 pm
Location: In-Person - George R. Brown Convention Center, General Assembly (Speakers presenting via Zoom)
Moderator: Isaac Aviles

Panelists review the kinds of data management challenges they have had to work with in the last 24 months, and the strategies that have worked for them. Issues of data standards, integrating legacy information with new data, and challenges associated with the merger of two companies are just some of the topics that will be tackled.

Panelists:
- Philip Neri, Director of Marketing, Energistics
- Eduardo Zavala, Senior Director of Business Transformation, Delek
- Kim Padeletti, OSDU, Amazon
- Phillip Jong, OSDU Director, Shell
- Junxuan Fan, Secretary General, Deeptime Digital Earth
- Jamie Cruise, Digital Subsurface Product Manager, Schlumberger
SPECIAL SESSIONS

Hydraulic Fracturing Test Site- 2 Part I, II, and III

Time: 10:45 am – 5:35 pm
Location: In-Person – George R. Brown Convention Center, Room 360
Co-Chairs: Vinay Sahni and Gary Covatch

The Hydraulic Fracturing Test Site (HFTS) Program is a research and development (R&D) partnership sponsored by the U.S. Department of Energy, National Energy Technology Laboratory (DOE-NETL) and major and independent operator and service companies, managed by the Gas Technology Institute (GTI). The objectives of the HFTS program are to diagnose and understand the hydraulic fracturing process for field development optimization in Unconventional Resources, minimize their environmental impacts by reducing the number of new wells required for effective resource recovery, and improve extraction economics to expand the economically viable resource at increasingly lower commodity prices. A unique aspect of the test sites is the drilling of research wells dedicated to coring through the created hydraulic fractures thus directly measuring fracture locations, fracture quantity, proppant concentrations and other data.

There are currently two test sites in the program, both in the Permian Basin. HFTS-1, operated by Laredo Petroleum, is located in the Midland Sub-Basin, and was the subject of an URTeC Invited Session in 2018. HFTS-2, operated by Occidental Petroleum, is in the Delaware Sub-Basin. Since results of the R&D are confidential to the program sponsors for a period of 2 years, early results from HFTS-2 are just now becoming publicly available and will be the subject of the presentations in this session.

Speakers:
• Overview of the Hydraulic Fracturing Test Site 2 (HFTS-2) in the Permian Delaware Basin
  Jordan Ciezobka, GTI
• Subsurface Characterization of Hydraulic Fracturing Test Site – 2 (HFTS-2), Delaware Basin
  Fadila Bessa, Occidental
• Fracture Description of the HFTS-2 Slant Core, Delaware Basin, West Texas
  Julia Gale, The University of Texas at Austin
• Microseismic at HFTS2: A Story of Three Stimulated Wells
  Bo Howell, Borehole Seismic
• Mechanism of Microseismic Generation During Hydraulic Fracturing – With Evidence from HFTS 2 Observations
  Yunhui Tan, Chevron
• HFTS-2 Completions Design and State-of-the-Art Diagnostics Results
  Matt Jones, Occidental
• An Integrated View of Hydraulic Induced Fracture Geometry in Hydraulic Fracture Test Site 2
  Gustavo Ugueto, Shell Exploration & Production Company
• Hydraulic fracture characterization by integrating multidisciplinary data from the Hydraulic Fracturing Test Site 2 (HFTS-2)
  Zhishuai Zhang, Chevron Technical Center
• Analysis of Completion Design Impact on Cluster Efficiency and Pressure-Based Well Communication in HFTS-2 Delaware Basin
  Andrea Vissotski, Chevron

ConocoPhillips: Unconventional Reservoirs and Technology Showcase

Time: 10:45 am – 12:05 pm
Location: In-Person – George R. Brown Convention Center, Room 351
Co-Chairs: Evan Lamoreux, David Jones, Robert Hull, and Jim Hnat

In this session ConocoPhillips will provide an overview of their best-in-class Unconventional Portfolio as well as the key technologies and strategies to develop and optimize these assets. ConocoPhillips will also highlight key takeaways and the interrelationships that can be drawn between the various technical papers that will be shared in the technical sessions.

Speakers:
• Michael Hatfield, Chief Technology Officer and Senior Vice President, Global Technical Functions, ConocoPhillips
• Jack Harper, President Permian, ConocoPhillips
• David Forbes, General Manager Global Wells, ConocoPhillips
• Ed Connelly, General Manager Global Production, ConocoPhillips
• Wendy King, Vice President Gulf Coast, ConocoPhillips

TOPICAL LUNCHEONS

Chevron Permian Asset Optimization: Overview of Chevron’s Strategy of Leading Performance

Time: 12:15 pm – 1:30 pm
Location: In-Person – George R. Brown Convention Center, Room 342
Fee: $65
Speaker: Jennifer Wilding, Portfolio Development Manager, Midcontinent, Chevron

This topical luncheon will showcase Chevron’s strategy of leading performance through behaviors and competitive performance to strive for higher returns and lower carbon. The luncheon will review high-level development strategy including a review of past performance and future predictions within Permian Basins, integrated modeling, data analysis, and continuous learning.

Spacing Ourselves to Death

Time: 12:15 pm – 1:30 pm
Location: In-Person – George R. Brown Convention Center, Room 381
Fee: $65
Speaker: Justin Hayes, Vice President Reservoir Engineering and Analytics, Bedrock Energy Partners

Unconventional resources require just as much effort on economics as they do on subsurface understanding. Practices to simplify the corporate financial and subsurface models for the purpose of communicating between teams have led companies to make suboptimal decisions. Those decisions have severely impacted corporate returns. An integrated methodology will better serve unconventional E&P’s and their investors.
TOPICAL BREAKFASTS

Practical Aspects of Core/Log Integration in Organic Mudstones and How it Impacts Business Decisions and Overall Cost of Value of Information

**Time:** 7:00 am–8:15 am  
**Location:** In-Person – George R. Brown Convention Center, Room 382  
**Fee:** $40  
**Speaker:** Joe Comisky, Senior Technical Advisor for Petrophysics, Devon Energy

This talk will present several workflows and observations I use when reducing all of the various physical and chemical measurements we make in the lab to the properties sensed by the downhole logging tools. This approach also effectively identifies potential conflicts between cores and logs when one series of measurements may be compromised.

Charting a Course – Oilfield Services, Technologies, Trends, and the Impact on Domestic Producers

**Time:** 7:00 am–8:15 am  
**Location:** In-Person – George R. Brown Convention Center, Room 381  
**Fee:** $40  
**Speaker:** Stephen Ingram, Vice President South Central Area USA, Halliburton

Within this discussion, the presenter will outline major choices Halliburton took during the impacted period of 2019 and 2020. Leveraging technologies to improve service delivery and client solutions. Topics will include but not be limited to simultaneous fracturing techniques, alternative power solutions, smart fracturing methods and the increasing role of digitalization within the sector.

PE Opportunity Space in Upstream, Midstream, and Renewables and What Critical Assessments You Look for or Target for Possible Investment and Why

**Time:** 7:00 am–8:15 am  
**Location:** In-Person – George R. Brown Convention Center, Room 342  
**Fee:** $40  
**Speaker:** Basak Kurtoglu, Senior Vice President – Technical Reservoir and Technology Quantum EP

See URTeC.org for details.

PANEL SESSIONS

ESG in Action: Flare Reduction, Leak Detection, Logistics, Blended Solar / Geothermal / Wind Electricity Generation Projects, Social License to Operate

**Time:** 8:25 am–10:15 am  
**Location:** In-Person – George R. Brown Convention Center, General Assembly  
**Moderator:** Katerina Yared

How are ESG guidelines shaping decision-making in companies? The panel will discuss specific examples of the adoption of new technology to eliminate flaring, blend energy sources, and make decarbonization possible and economically viable. Also discussed is RSG – responsibly sourced gas.

**Panelists:**  
- Steve Dyer, Wells Production Systems Domain Head, Schlumberger  
- Anna Scott/Charlie Losche, President, Project Canary  
- Vanessa Ryan, Manager of Carbon and Climate Policy, Chevron  
- Birol Dindoruk, Professor, University of Houston  
- Hamed Soroush, President, PETROLERN LLC  
- Vanessa Ryan, Manager of Carbon and Climate Policy, Chevron

Sensors, Automation, and Smart Digital Operations: Where We are and the Road Ahead

**Time:** 10:45 am–12:05 pm  
**Location:** In-Person – George R. Brown Convention Center, General Assembly  
**Moderator:** David Hume

New uses of sensors and integrated analytics are making it possible to dramatically improve efficiency and to change the way that work is done. The panel will discuss new directions, examples that they have observed, and how they view the road ahead.

**Panelists:**  
- Alex Nikulin, Aletair  
- Bear Givhan, Earthview  
- David Thul, Founder, Geolumina  
- David Tonner, President, Diversified Well Logging  
- Aaron Lazarus, Chief Scientist, Pioneer Natural Resources

Learning from Other Industries: A Geothermal Conversation

**Time:** 1:45 pm–3:30 pm  
**Location:** In-Person - George R. Brown Convention Center, General Assembly (Speakers presenting via Zoom)  
**Moderator:** Isaac Aviles

Panelists with strong geothermal backgrounds will discuss the synergies and know-how that the oilfield can bring in developing the geothermal industry.

**Panelists:**  
- Ahmad Ghassemi, University of Oklahoma  
- Joseph Moore, Utah FORGE  
- Mukul Sharma, University of Texas at Austin  
- Tim Latimer, Chief Executive Officer, Fervo Energy  
- Danny Rehg, Partner, Criterion
Supply Chains in Energy: Cost Savings, Quality Assurance, 3-D Printing, Ethical Sourcing

Time: 4:05 pm–5:25 pm  
Location: In-Person – George R. Brown Convention Center, General Assembly  
Moderator: Carrie Glaser

As workflows are automated and new kinds of energy technologies are implemented, supply chain issues come to the forefront. Panelists will discuss some of the most prominent advances in supply chain practice, including provenance, authenticity assurance, blockchain, automation, multiple sourcing, and 3-D printing.

Panelists:
- Anna Scott, President, Project Canary  
- Don Herman, Director of Business Development, Cordax  
- Jennifer Guo, General Manager Upstream, Chevron  
- Rani Puranik, Co-Owner, Worldwide Oilfield Machine  
- Laura Capper, President, EnergyMakers Advisory Group

SPECIAL SESSIONS

Best of ARMA

Time: 8:25 am–10:10 am  
Location: In-Person – George R. Brown Convention Center, Room 370  
Co-Chairs: John McLennan and Ahmad Ghassemi

ARMA, the American Rock Mechanics Association, enfranchises specialists in all surface and subsurface rock engineering disciplines – from tunneling to mine design to drilling, hydraulic fracturing, subsidence, and seismicity assessment. Membership is international, with members from 37 nations. The ARMA Special Session provides insights from four senior practitioners. The theme of the session is application of rock mechanics principles, measurements, and simulations to characterize, comprehend, and exploit in situ mechanical properties, discontinuities, stresses, and treatment parameters.

Speakers:
- Mitigating Hydraulic Fracture Induced Seismicity  
  Shawn Maxwell, Geophysical and Geomechanical Advisor, Ovintiv  
- Hydraulic Fracture Design Needs Beyond Achieving Short-Term Production Metrics  
  C. Mark Pearson, President & CEO, Liberty Resources LLC  
- Completions-Induced Casing Deformations in Unconventionals: What We Think We Know  
  Neal Nagel, Chief Engineer and Principal, OilField Geomechanics LLC  
- Managing Induced Seismicity on Pre-Existing Faults During Hydraulic Fracture Stimulation  
  Dale Walters, RS Energy Consultants Ltd

Hydraulic Fracturing Test Site – 2 Part IV and V

Time: 8:25 am–12:15 pm  
Location: In-Person – George R. Brown Convention Center, Room 360  
Co-Chairs: Gustavo Ugueto and Jordan Ciezobka (See page 14 (HFTS-2 Part I, II, and III) for description)

Speakers:
- Observations and Modeling of Fiber-Optics Strain on Hydraulic Fracture Height Growth in HFTS-2  
  Jiehao Wang, Chevron  
- A New Fracture Diagnostic Tool for Unconventionals High Resolution Distributed Strain Sensing via Rayleigh Frequency Shift during Production in Hydraulic Fracture Test 2  
  Gustavo Ugueto, Shell Exploration & Production Company  
- A Systematic Interpretation of Subsurface Proppant Concentration from Drilling Mud Returns: Case Study from Hydraulic Fracturing Test Site (HFTS-2) in Delaware Basin  
  Debobyam Maity, Gas Technology Institute  
- Analysis and Integration of the Hydraulic Fracturing Test Site ~ 2 (HFTS-2) Comprehensive Dataset Venkateswaran Striam Pudugramam, Occidental  
- Novel Geochemistry Determined From High Pressure, High Temperature Simulation Experiments of Hydraulic Fracture Test Site 2  
  Djuna Gulliver, NETL-DOE  
- Inference of Induced Fracture Geometries Using Fiber-Optic Distributed Strain Sensing in Hydraulic Fracture Test Site 2  
  Alexei Savitski, Shell Exploration & Production Company  
- Key Learnings from Hydraulic Fracturing Test Site - 2 (HFTS-2), Delaware Basin  
  Yu Zhao, Occidental

ConocoPhillips: Optimizing Through Completion Design and Production Analysis

Time: 1:45 pm–3:30 pm  
Location: In-Person – George R. Brown Convention Center, Room 351  
Co-Chairs: Yongshe Liu and Robert Hull

ConocoPhillips will present four technical papers in this session that will focus on UR characterization workflows and production performance analysis and optimization.

Speakers:
- To Reduce or Extend? That is the Question: A Tale of Stage Length Optimization in the Delaware Basin  
  Karan Dhuldhoya  
- Well Performance Management – Case Study for Montney  
  Vishal Bang  
- The Case for Surfactant Lift in Oil Wells  
  Stuart Scott  
- Production Diagnostics with Time Lapse Geochemistry  
  Yishu Song
EOR: Best of Tulsa—Recovery Improvement for Unconventional/Tight Systems

Time: 1:45 pm–3:30 pm
Location: In-Person – George R. Brown Convention Center, Room 360
Co-Chairs: Birol Dindoruk, Ram Ratnakar, and Ali Rezaei

This section will air a selected set of papers of Tulsa 2020 IOR symposium in the area of unconventionals focusing in recovery improvement and concepts that impact the recovery processes. In this session, we have a good mix of papers that span from the basics and fundamentals to all the way to implementation aspects of recovery improvement for unconventionals and other permeability challenged systems. Some of the presentations will also focus on lessons learned from the project work.

Speakers:
- **Successful Field Implementation of CO₂ Foam Injection for Conformance Enhancement in the EVSAGU Field in the Permian Basin**
  - Amit Katiyar
- **A Methodological Workflow for Assessment and Design of Huff and Puff – Hydrocarbon Gas Injection Pilot Test as an EOR Technique for Eagle Ford Shale Oil Reservoirs**
  - Amanda Baldwin
- **Measurement of Minimum Miscibility Pressure: A State-of-the-Art Review**
  - Birol Dindoruk
- **Evaluation of Eagle Ford Cyclic Gas Injection EOR: Field Results and Economics HTFS**
  - Chris Barden

TOPICAL LUNCHEONS

Future of Unconventionals – Geoscience and Engineering Aspects

Time: 12:15 pm–1:30 pm
Location: In-Person – George R. Brown Convention Center, Room 342
Fee: $65
Speaker: Tom Blasingame, Professor, Department of Petroleum Engineering, Texas A&M University

This presentation discusses the geoscience and engineering aspects based on the work of a small study group convened for this purpose as well as a large-scale “crowd-source” effort by the presenter. The presentation covers geology, geophysics, petrophysics, PVT, productions/operations, well spacing/placement, reservoir engineering (Diagnostics, RTA/PTA, Modeling), reserves (DCA), and data analytics topics, as well as the integration of these topics.

Energy 4.0: How to Design a Future-Proof Digital Asset that Hits the Financial Bottom Line

Time: 12:15 pm–1:30 pm
Location: Online
Speaker: Sanjay Paranji, Chief Executive Officer, Xecta Digital Labs

Concepts & Framework from a combination of experiences of being a CTO of an upstream operator and the CEO of a digital solutions provider with global scale and reach. The talk will use the unconventional resource experience as backdrop for how to utilize emerging trends in digital technology, create groundbreaking advances in operating models, explore the ongoing drive from executive initiatives who want to embrace digital but often encounter obstacles in execution, and successfully implement an enterprise level change management program where technology could be utilized to reshape business workflows and decision frameworks from the old and traditional to the new and agile.

Environmental, Social, and Corporate Governance: A Different Take

Time: 12:15 pm–1:30 pm
Location: Online
Speaker: Chris Wright, Chief Executive Officer and Chairman, Liberty Oilfield Services

Environmental, Social, and Corporate Governance (ESG) has been a topic of extremely high interest of late. The broad idea is for companies to report their policies and action on ESG issues. This talk will give a perspective on this topic based on the simple perspective of bettering human lives.

Exploration and Inventory Assessment in the Age of Capital Efficiency and Free Cash Flow

Time: 12:15 pm–1:30 pm
Location: In-Person – George R. Brown Convention Center, Room 381
Fee: $65
Speaker: Harris Cander, Vice President of Resource Capture, Marathon Oil Company

In 2019, Marathon publically announced the discovery of a >50,000 acre Woodford and Meramec stacked oil play on the eastern edge of the Delaware Basin. The discovery occurred as the onshore U.S. industry had transitioned from an age of growth to an age where investors are demanding free cash flow, capital efficiency, and capital discipline. This change has prompted a reckoning where many companies have had to re-assess their inventories of profitable drilling locations. This talk will cover the key exploration principles and methods that resulted in the discovery, as well as philosophies on early well costs, completions, location of appraisal wells, and the difference between a “bench” and a petroleum flow unit. The example will then be used as a launching pad to provide insight on several broader topics: What is inventory and what are the metrics for quantifying undrilled inventory in an existing area or a new play? How can exploration and appraisal projects compete for capital when compared with mature, high-return assets in the age of capital efficiency and free cash flow?
identifying locations for storage of human-generated carbon dioxide (CO2). The US Department of Energy has sought to encourage this development around clean energy and sustainable workforce concerning company culture education, training, and job development.

Plan now to hear more on investing in the energy sector in the current environment and on energy transition and suitability. This talk will incorporate thoughts on social issues of contemporary applications will be complemented with a survey of future technological challenges for low-risk and financially viable exploration and development.

This presentation will summarize the state-of-the-art in the formation evaluation of unconventional subsurface resources, with emphasis on measurement technology and integrated interpretation approaches. Examples of unconventional subsurface resources will be complemented with a survey of future technological challenges for low-risk and financially viable exploration and development.

Hess has a significant acreage position in the Bakken with a substantial future drilling inventory. The presentation will describe how lean thinking and innovation have been applied to streamline execution and drive growth, and how this will continue going forward to optimize activity and maximize asset value.

A significant component of the current energy transition is identifying locations for storage of human-generated carbon dioxide (CO2). The US Department of Energy has sought to encourage this development through its Carbon Storage Assurance Facility Enterprise (CarbonSAFE) program. After a successful CarbonSAFE Phase I project, a Phase II project was undertaken to explore commercial-scale CO2 storage in the United States midcontinent region across the Patterson site in Kearny County, Kansas and the Sleepy Hollow site in Red Willow County, Nebraska. The Patterson 5-25 well in Kearny County, KS, was drilled, cored, and logged in early 2020 with drilling operations spanning from before and extending into the early pandemic-related lockdowns. Over 774 ft of 4-inch diameter core was collected across 17 runs that recovered Atoka, Morrow, Osage/Kindermaker, Viola, Arbuckle, and Granite Wash/Reagan Formations, as well as the Precambrian basement granite. The core analysis was a vital part of the project to test fluid flow and mechanical properties of potential CO2 reservoirs and their associated sealing intervals. Investigation into the porosity and permeability for each formation was conducted along with a full program covering rock fabric and properties. In addition, a special core analysis program was designed to investigate mechanical properties and multi-phase fluid flow properties. Initial characterization across all formations is reviewed and will be utilized to drive subsequent detailed analysis of the various seals and reservoirs through the section. The impact of CO2 injection with the rocks and fluids is discussed in preparation for the last stage of analysis. Reviews of both new and traditional core analysis methods are explored for the application of CO2 storage and compared with normal protocols used in oil and gas exploration.

Panelists discuss the newest developments and directions in drones, satellite imagery, and other ways to acquire and process images of the Earth's surface. They discuss the technologies and processes they use, and the costs and overall return on investment with respect to new opportunities and business development. Applications include exploration and operations in critical minerals as well as oil and gas, environmental monitoring and intervention, and energy utilization.

Hess In The Bakken: Lean and Innovation Driving the Next Stage of Development

Assessing Risk and Evaluating Opportunities from Different Perspectives

Panelists: • Rusty Gilbert, President, Gilbert Energy • Raoul LeBlanc, Vice President – Energy, IHS Markit • Jim Grant, Vice President – Subsurface, Chesapeake • Pushplesha Sharma, Senior Research Data Scientist, Inveniam Research • Nishant Jha, Well Performance President, Schlumberger

Earth’s Surface Imaging for Pivoting: Affordable Drones and Satellite Imaging for Geological Exploration and Operations, Environmental Monitoring, and Energy Utilization

Panelists:

- Victoria Natalie, Director, Engineering Program, Oklahoma State University
- Dan Taranik, Exploration Mapping
- Fernando Lopez, Global Business Development Manager, Kairoos Aerospace
- Sunil Garg, President, DataVedik
- Ron Bell, Drone Geoscientist, Drone Geoscience, LLC
- Shaun Baker, Senior Manager Solutions Architecture, Amazon Web Services
The New Way to Work: Digital Platforms, Cloud-Based Collaborations, and Ecosystems

| Time:   | 1:45 pm–3:30 pm |
| Location: | In-Person – George R. Brown Convention Center, General Assembly |
| Moderator: | Andrew Munoz |

This session will probe the way that work is done, both in operations and in supportive roles. Companies will discuss the typical new tasks, and also the professionals they hire to do the task, and how they work. We will also discuss specific examples of technologies being used, and how they are contributing to a safer, more efficient, and profitable endeavor.

Panelists:
- Jim Grant, Vice President, Subsurface, Chesapeake
- Liz Bennett, Vice President of Data Architecture, Wood Mackenzie
- Vitaly Meyer, President, PetroCub
- Sathiya Namasiyam, Vice President of Data and Analytics, TGS
- Philippe Herve, SparkCognition
- Jason Fitzgerald, Director of Business Development, MineralWare

Global Unconventionals

| Time:   | 3:50 pm–5:10 pm |
| Location: | In-Person – George R. Brown Convention Center, General Assembly (Speakers presenting via Zoom) |
| Moderator: | Luis Baez |

The description of the plenary is as follows: “Unconventional resource development in North America has seen success in over 20 years of commercial activity with continuous innovation and development activity spanning over multiple geologic basins. Whilst an early surge of international opportunities were observed, we have seen limited success globally in the commercialization of unconventional resources. During this URTeC program, you will gain additional insight and even some possible solutions to the challenges of Unconventionals in international plays from operators that continue to progress these opportunities.”

Panelists:
- Mohamed Al Zaabi, ADNOC Abu Dhabi
- David Close, Santos
- Robert Clarke, Wood Mackenzie

DOE – Insights on Relationship Between Matrix Geochemistry and Production: From Pores to Fractures

| Time:   | 9:00 am–10:00 am |
| Location: | In-Person – George R. Brown Convention Center, Room 360 (Speakers presenting via Zoom) |
| Moderator: | Isaac Aviles |

This panel will focus on fundamental insights on geochemical processes influencing production from shales at multiple spatial scales, from nanopores through the matrix and fractures to the reservoir.

Speakers:
- Unlock Nanopores: Fundamental Understanding and Engineering Implications; Yifeng Wang, Sandia National Laboratories
- Scale Mineralization in Fracture Faces: Impact of Fluid-Rock Interactions on Permeability; John Bargar, Stanford Linear Accelerator Center
- Impact of Reactive Flow Pathway on Permeability Changes Along Primary Fractures; Alexandra Hakala, National Energy Technology Laboratory
- Incorporating Nanoconfinement Effects Into Reservoir Simulators; Hari Viswanathan, Los Alamos National Laboratory
DOE – Insights on How to Optimize Production: Take-Home Messages

Time: 11:15 am–12:05 pm
Location: In-Person – George R. Brown Convention Center, Room 360
Moderator: Isaac Aviles

This panel will combine knowledge presented by the national laboratory fundamental shale portfolio to discuss important considerations required when working in unconventional oil/gas shales. This will include stimulation and production practices using the best available knowledge for maximizing production and minimizing environmental impact.

Speakers:
- The Role of Pressure Management in Maximizing Production and Minimizing Environmental Impact
  Hari Viswanathan, Los Alamos National Laboratory
- Understanding Geochemical Signatures in Unconventional Reservoirs
  Christina Lopano, National Energy Technology Laboratory
- The Interplay Between Injection Fluid Chemistry and the Stimulated Rock Volume: Addressing the Roles of Base Fluids, Additives, and Solids
  Adam Jew, Stanford Linear Accelerator Center

Best of SPWLA

Time: 1:45 pm–3:30 pm
Location: In-Person – George R. Brown Convention Center, Room 360
Moderator: Katerina Yared

The Society of Petrophysicists and Well Log Analysts (SPWLA) is a non-profit organization dedicated to the advancement of petrophysics, log and core measurements, formation evaluation techniques, and hydrocarbon, mineral, and water resources. The SPWLA is pleased to showcase a selection of top-rated unconventional reservoir-focused papers presented at its Annual Symposium May 2021. The papers will highlight new technologies and techniques that are designed for the specific issues faced by operators in tight oil/gas formations and shale-rich formations. We will also examine the impact of near-crisis conditions in the oil industry, and how that has altered the approaches to petrophysics analysis and well logging.
TOPICAL LUNCHEONS

Promoting Cased Hole Formation Evaluation (CHFE) as an Alternative to Openhole Logging for Completion Design in Horizontal Wells

There are numerous reasons to promote Cased Hole Formation Evaluation in unconventional reservoirs. Basic cased hole measurements have been offered as commercial measurements for over 50 years but their applications have primarily been reservoir monitoring or as a contingency in cases where openhole logs could not be run. This talk will suggest that CHFE be utilized as an alternative to standard openhole formation evaluation logging to alleviate the risks traditionally associated with openhole logging in horizontal wellbores. This information can then be used to scientifically design a more efficient completion.

Casing Damage and Hydraulic Fracturing: Geomechanical Perspectives

Casing damages have been found in many stimulated wells worldwide. While other mechanisms such as mechanical, thermal, and chemical can be responsible, this talk will focus on and clarify geomechanical contributions during and after hydraulic fracturing. Through case studies, key contributors to casing integrity are evaluated with varying casing properties, pipe eccentricities, cement channels, borehole breakouts, injection pressures, as well as different loading mechanics such as compression, shear, or combined. Dynamic rock changes induced by stimulation are quantified and compared to the threshold triggering casing damage.

B Minus – Must Try Harder: Some Thoughts on the Current State of the Art in Unconventional Play and Reservoir Evaluation

Geologists working unconventional plays can often be heard complaining that engineers ‘just don’t want to listen to us’ or that they ‘just want to mow it down’ without consideration of changing geologic factors. Engineers on the other hand are faced with the task of ‘getting it done’ and understandably are looking to find practical and helpful results from geoscience workflows. Geoscience workflows in unconventional play and reservoir evaluation originated almost 2 decades ago in the laboratories - the first point of contact with the rock involving measurements from core. Evaluation ‘checklists’ reflected the measurements made in the laboratory - such as organic carbon content; rather than those important to determining oil in place, recovery, and flow rate - such as viscosity. Assertions that the gas saturation could be derived as (1-water saturation) would later be found to be flawed. The primary role of a commercial geochemical laboratory is not to derive new interpretation methods, and old interpretation schemes from the late 70’s and 80’s were exhumed; and these largely remain the frame of reference that results are presented in today. The result: our ongoing insights of shale geochemistry is through a foggy 40-year-old lens - perhaps the most unfortunate bad habit being the use of vitrinite reflectance as a frame of reference in rocks where vitrinite is scarce or absent. As the liquids plays emerged in the last decade, core laboratories’ protocols scrambled to adapt from the dry gas methods, but without recognizing the importance of processes such as organic absorption on deriving more considered saturations - what is vaporizable or solvent-extractable is not necessarily in the reservoir fluid phase in the rock! Lading zones in mature plays seem to be resistive to challenge, even though new saturation methods can show sweet spots in different parts of the reservoir. Are we just waiting for the oil price to save us again; or are we willing to try further optimization? Some large OilCo’s leveraged the use of ‘modern’ petrophysical and fluid modeling approaches to provide engineers with maps showing quantitative GOR (considering reservoir storage that drives ‘cumulative’ vs ‘instantaneous’ fluid capture), pressure and viscosity; but public exposition of these workflows has been relatively recent. These workflows allow a relatively small number of expensive well datasets to be rapidly and inexpensively extrapolated and interpolated in the early to mid-stage of development.

BPX Energy: Technical Evolution Through Applied Physical Analytics

BPX Energy is transforming the way we develop assets while generating premier economic returns. Our digital development platform integrates physical analytics with engineering and geoscience principles and subsurface data to make intelligent predictions for well performance. In this keynote, we will showcase several examples of BPX-proprietary technology and demonstrate how we leverage these tools to make data-driven investment decisions.
NETWORKING OPPORTUNITIES

OPENING RECEPTION
Day: Monday  
Time: 5:00 pm–6:00 pm  
Location: In-Person – George R. Brown Convention Center, Exhibit Hall E

End your first day at URTeC and unwind with a drink and light hors d’oeuvres as you network with exhibitors and industry colleagues in the Exhibit Hall.

REFRESHMENT BREAKS
Days: Monday–Wednesday  
Times: 10:00 am–11:00 am (Monday, Tuesday, and Wednesday)  
3:00 pm–4:00 pm (Monday and Tuesday)  
Location: In-Person – George R. Brown Convention Center, Exhibit Hall E

Grab a cup of coffee or tea in-between sessions and check out some of the exhibitor presentations to learn about the latest products and services.

NETWORKING RECEPTION
Day: Tuesday  
Time: 5:00 pm–6:00 pm  
Location: In-Person – George R. Brown Convention Center, Exhibit Hall E

Finish up day two at URTeC with a drink while networking with exhibitors and other colleagues.

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- Access the full speaker list and bios
- Connect directly with exhibitors
- Find general event information, times, and locations
- Set up your personal profile and schedule
- Use the networking feature to chat with attendees
### SHORT COURSES

<table>
<thead>
<tr>
<th>Title</th>
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<tbody>
<tr>
<td>1. Principles of Energy Storage and Carbon Capture Utilization and Storage</td>
<td>Hannes E. Leetaru, Scott Frailey, Sherilyn Williams-Stroud, and Steve Whittaker (Illinois State Geological Survey)</td>
<td>Online</td>
<td>Saturday, 24 July 2021, 8:00 am–5:00 pm</td>
<td>Members $250, Non-Members $300, Students $125</td>
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<tr>
<td>2. The Geology of Unconventional Reservoirs</td>
<td>Bruce Hart (Western University)</td>
<td>Online</td>
<td>Thursday, 22 July–Sunday, 25 July 2021, 9:00 am–1:00 pm</td>
<td>Members $500, Non-Members $600, Students $250</td>
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<tr>
<td>3. Understanding Signals: Basic Waveform Analysis from a Geophysical Perspective</td>
<td>Michael Burianyak (Meta Innovation Technologies)</td>
<td>Online</td>
<td>Thursday, 22 July–Sunday, 25 July 2021, 9:00 am–1:00 pm</td>
<td>Members $500, Non-Members $600, Students $250</td>
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<tr>
<td>4. Methane Emission Measurement &amp; Mitigation (MEMM)</td>
<td>Darcy Spady (Independent Director and Technical Advisor)</td>
<td>Online</td>
<td>Thursday, 29 July 2021, 8:00 am–5:00 pm</td>
<td>Members $300, Non-Members $400, Students $150</td>
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<tr>
<td>5. Gas EOR in Tight Unconventionals</td>
<td>Curtis Hays Whitson (NTNUPE) and Mathias Carlsen (Whitson)</td>
<td>Online</td>
<td>Thursday, 29 July–Friday, 30 July 2021, 8:00 am–5:00 pm</td>
<td>Members $500, Non-Members $600, Students $300</td>
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<tr>
<td>6. Reservoir Engineering Applications of Advanced Data Analytics and Machine Learning Algorithms</td>
<td>Ashwin Venkatraman (ReserMine)</td>
<td>Online</td>
<td>Thursday, 29 July–Friday, 30 July 2021, 8:00 am–5:00 pm</td>
<td>Members $500, Non-Members $600, Students $300</td>
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### Cancelled Short Courses
- SC-02: Harnessing the Power of the Beast: A Machine Learning Workshop for Geoscientists (Online)
- SC-03: How Engineers Make Money Using Geophysics
- SC-04: Advanced Seismic Techniques: Concepts & Examples
- SC-05: Petrophysics and Geophysics Relevant to CO2 Enhanced Oil Recovery
- SC-08: URTeC – The Unconventional Well Test: Theory, Design, and Interpretation
- SC-09: Mastering Uncertainty and Risk in Unconventional Reservoir Assessment
- SC-10: Unconventional Reservoir Production (Rate-Transient) Analysis
- SC-11: Forecasting Well Production Data in Unconventional Resources
- SC-12: Critical Geomechanics Concepts and Applications to Unconventionals Completions
- SC-14: An Overview of Multistage Completion Systems for Hydraulic Fracturing
- SC-15: Applied Concepts in Fractured Reservoirs

Visit URTeC.org for detailed information.

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### TRUSTED UPSTREAM COVERAGE

Petroleum News is a weekly oil and gas newspaper based in Anchorage, Alaska. Our editorial objective is to provide timely and trustworthy news coverage of upstream development in Alaska and Northern Canada, including news from around the world as it impacts the arctic oil and gas industry. For information on advertising, call Susan Crane at (907) 250-9769. To subscribe, call Renee Garbutt at (281) 978-2771 or visit www.petroleumnews.com
Theme 1: Operators’ Forum: Case Studies Highlighting the Multidisciplinary Approach to Exploration, Appraisal, Pilot Tests, and Development of Unconventional Resources
Theme 2: Advanced Formation Evaluation of Unconventional Reservoirs
Theme 3: Geological Characterization and Evaluation Spanning the E&P Lifecycle
Theme 4: Geophysical Unconventional Reservoir Analysis
Theme 5: Geomechanics – The Intersection of Geoscience and Engineering
Theme 6: Applied Geochemistry for Unconventionals: From Source Rock to Produced Hydrocarbons
Theme 7: Machine Learning, AI, and Big Data in the Digital Oilfield
Theme 8: Unlocking the Production and Recovery Potential of Unconventionals
Theme 9: Reserves Estimation and Production Forecasting
Theme 10: New Materials and Innovative Technologies as Applied to Unconventionals
Theme 11: International and Emerging Challenges of Unconventional Resources: Integrated Geoscience and Engineering
Theme 12: Business of Unconventional Plays
Theme 13: Sustainability, Rapid Industry Change, and the Social License to Operate
Theme 14: Special Sessions

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# Technical Sessions at a Glance

Sessions are numbered by theme — see page 24 for the full list.

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<tr>
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<td>Theme 2: Emerging Petrophysical Evaluations and Completion Quality</td>
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**Exhibit Hall Closed**

| Carbon Capture, Utilization, and Storage I | Carbon Capture, Utilization, and Storage II |
MONDAY TECHNICAL PROGRAM

IN PERSON

Opening Plenary Session: Unconventionals in Transition
General Assembly
Chairs: S. Rhodes, D. Valleau
8:25 am–10:05 am (See page 13 for summary)
• Introductory Remarks
• Occidental’s Path to Carbon Neutrality
  V. Hollub, OXY
• Social Engineering Meets Petroleum Engineering - Goals Versus Realities for Today’s Energy Sector
  B. Brackett, Bernstein Research
• The Real Global Energy Transition: From Poverty to Prosperity
  S. Tinker, BEG
• Outrun the ESG Bear or Just the Company Next to You?
  J. Sweek, Darcy Partners
• Q&A

Theme 1: Optimizing Development Strategies I
Exhibit Hall - Station A
Chairs: K. Hartig, A. Lorwongngam
10:30 Introductory Remarks
10:35 High Viscosity Friction Reducer Testing, Trialing, and Application Workflow: A Permian Basin Case Study
  N. Zakhour, S. Esmaeil, J. Ortiz, J. Deng (Occidental Petroleum)
11:00 Applying State-of-the-Art Completion Techniques in Vaca Muerta Formation
  P. Crespo1, M. Pellicer1, H. Jacot2 (1Pan American Energy; 2H-Frac Consulting)

Theme 5: Hydraulic Fracturing: Monitoring, Modeling, and Analysis IV
Exhibit Hall - Station B
Chairs: V. Sesetty, S. Rhodes
10:30 Introductory Remarks
10:35 Modeling the Effect of Natural Fracture Network and its Properties on Multi-Stage Stimulation
  B. Damjanac, C. Detournay, M. Torres (Itasca Consulting Group, Inc.)
11:00 3-D Digital Mineral Mechanical Modeling of Complex Reservoirs Rocks for Investigation of Fracture Propagation at Microscale
  V. Nachev1,2, A. Kazak3, S. Turuntaev2, (1Moscow Institute of Physics and Technology; National Research University); 
  2Sadovsky Institute of Geospheres Dynamics of Russian Academy of Sciences; 3Skolkovo Institute of Science and Technology)

Panel Session: The Road Ahead for New Technology Now: Funding and Commercialization
General Assembly
Moderator: S. Nash
10:45 am–12:05 pm (See page 13 for summary)
• J. Thurmond, Hess
• T. Hussain, Delek US
• S. Coleman, Chevron
• S. Pai, Technology Collaboration Center

Theme 6: Water Management Perspective
Exhibit Hall - Station B
Chairs: S. Nash, E. Tomar, K. Bott
10:30 Introductory Remarks
10:35 ESG Reporting in the Oil and Gas Industry-A Permian Basin Case Studies
  Y. Pradhan, T. Blasingame, E. Gildin (Texas A&M University)
11:40 Managing Induced Seismicity: A System for Mapping the Geospatial Intersection of Saltwater Disposal Formations, Active Injection Intervals, Injection Pressures, and Volumes, Geologic Fault Lines and Seismic Events in the Permian Basin
  J. Adler, J. Cortina, C. Lemons* (Sourcewater, Inc.)

Panel Session: Implementing New Technologies in the Field: How Companies Are Approaching it in 2021 and Beyond
General Assembly
Moderator: A. Singh
1:45 pm–3:30 pm (See page 13 for summary)
• A. Henry; Eunike Ventures
• S. Neal; Chevron
• S. Garg; DataVedik
• S. Liu; Oxy

Special Session: ConocoPhillips Unconventional Reservoirs and Technology Showcase
Room 351
Chairs: E. Lamoreux, D. S. Jones, R. A. Hull, J. Hnat
10:45 am–12:05 pm (See page 14 for summary)
• M. Hatfield, CTO & SVP Global Technical Functions, ConocoPhillips
• E. Connelly, GM Global Production, ConocoPhillips
• J. Harper, President Permian, ConocoPhillips, Midland
• D. Forbes, GM, Global Wells, ConocoPhillips
• W. King, Vice President of Gulf Coast, ConocoPhillips

Special Session: Hydraulic Fracturing Test Sites Part I
Room 360
Chairs: V. Sahni, D. Craig, G. Covatch
10:45 am–12:15 pm (See page 14 for summary)
• Overview of the Hydraulic Fracturing Test Site 2 (HFTS-2) in the Permian Delaware Basin; J. Cicizboka (GTI)
• Subsurface Characterization of Hydraulic Fracturing Test Site - 2 (HFTS-2), Delaware Basin; F. Bessa, J. Jerath, C. Ginn, P. Johnston, Y. Zhao, T. Brown, R. Lopez, J. Kessler, B. Nicklen, V. Sahni (Occidental)

Theme 8: Case Studies
Room 370
Chairs: T. Firincioglu, F. Tovar
10:45 Introductory Remarks
10:50 Heavy Oil Polymer EOR in the Challenging Alaskan Arctic - It Works!
  A. Dandekar1, B. Bai2, J. Barnes3, D. Cercone4, J. Ciferno4, R. Edwards5, S. Ning5, W. Schulpen5, R. Seright5, B. Sheets1, D. Wang6, Y. Zhang6 (1University of Alaska Fairbanks; 2Missouri University of Science and Technology; 3Hilcorp Alaska LLC; 4DOE-National Energy Technology Laboratory; 5Reservoir Experts, LLC/Hilcorp Alaska, LLC; 6New Mexico Institute of Mining and Technology; 7University of North Dakota)
11:15 Predicting Oil Recovery Under Uncertainty for Huff-n-Puff Gas Injection: A Field Case Study in Permian
  E. Eltahan1, R. Ganjdanesh1, K. Sepehrnoori1, M. Thuesen2, J. Nohavitza2 (1The University of Texas at Austin; 2EP Energy)
11:40 Drawdown Management Strategies: Midland Basin Case Studies
  Y. Pradhan, T. Blasingame, E. Gildin (Texas A&M University)

Theme 13: Produced Water and Induced Seismicity…ESG Perspectives
Room 361
Chairs: S. Nash, E. Tokar, K. Bott
10:45 Introductory Remarks
10:50 ESG Reporting in the Oil and Gas Industry-A Permian Basin Water Management Perspective
  R. G. Branti, K. Bennett, S. Fox, S. Willard, A. Michel (B3 Insight)
11:15 Application of Electro-Oxidation Technology for Water Treatment and its Impacts on Rock Wettability
  J. Y. Zhang, L. Yuan, S. Jakhete, M. Sadriadeh, H. Dehghanpour (University of Alberta; Aqua Pulsar)
11:40 Managing Induced Seismicity: A System for Mapping the Geospatial Intersection of Saltwater Disposal Formations, Active Injection Intervals, Injection Pressures, and Volumes, Geologic Fault Lines and Seismic Events in the Permian Basin
  J. Adler, J. Cortina, C. Lemons* (Sourcewater, Inc.)

*Denotes presenter other than first author | Green icon denotes a team presentation
ONLINE ONLY

Theme 5: Experimental Rock Mechanics I
Online Only
Chairs: L. Louis, J. Kessler, D. N. Espinoza
10:45 Introductory Remarks
10:50 Connecting Geomechanical Properties with Potential for Proppant Embedment and Production Decline for the Emerging Caney Shale, Oklahoma
M. Bengtson, T. Lu, A. Katende, J. Rutqvist, D. Crandall, A. Haecker, G. King, J. Renk, M. Radonjic, A. Bungert
(1University of Pittsburgh; 2Oklahoma State University; 3Lawrence Berkeley National Laboratory; 4National Energy Technology Laboratory; 5Continental Resources, Inc.; 6GEK Engineering)

11:10 Experimental Study on Expansion Law of Micro-Fractures Induced by Shale Hydration
Y. Zhao, L. Tao, X. Zhang
(Southwest Petroleum University, China; 2Oil and Gas Technology Research Institute; 3Changqing Oilfield Company, Petrochina Company Limited)

11:30 The Effect of Capillary Condensation on the Geomechanical Properties of Tight Formations: An Experimental Investigation
A. Albannay, B. Bué, D. Katsuki
(1ADNOC; 2Colorado School of Mines)

Theme 9: EUR and Performance Prediction – DCA and Beyond I
Online Only
Chairs: L. Deng, C. Virues, D. Vo
10:45 Introductory Remarks
10:50 Establishing the Basis for a Multi-Segment Arps Decline Model
J. Lee (Texas A&M)

11:10 Transfer Learning with Recurrent Neural Networks for Long-term Production Forecasting in Unconventional Reservoirs
(1University of Pittsburgh; 2Chevron)

11:30 Understanding the Effect of Nanopores on Flow Behavior and Production Performance of Liquid-Rich Shale Reservoirs
A. Khanal, M. Khoshghadam, H. S. Jha, W. J. Lee
(1University of Texas at Tyler; 2New Dawn LLC.; 3Texas A&M University)

ALT

Shale Gas Development Potentials of the Jurassic Weald and Wessex Basins, South-East England: A Techno-Economic Evaluation
B. O. Bassey, E. A. Ana
(1Cranfield University; 2University of Calabar)

ALT

Fluid Characterization and Volumetric Assessment in the Montney, One Tricky Fluid System
(Pipestone Energy Corp.; 2McDaniel & Associates; 3Resopstrategies; 4Stratum Reservoir)

ALT

Rate-Transient Analysis of Communicating Wells Using the Dynamic Drainage Area (DDA) Concept
H. Ahmad, H. Hamidi, C. R. Clarkson (University of Calgary)

Theme 15: Geoscience Tools and Methods for Understanding the Rock
Online Only
Chairs: J. Cockbill, A. Sloan
1:45 Introductory Remarks
1:50 Permeability From NMR in the Unconventional Point Pleasant Formation
X. Wang, P. M. Singer, Y. Liu, Z. Chen, G. J. Hirakasi, Z. Yang, S. J. Seltzer, B. Sun, M. O. Wigand
(1Rice University; 2Chevron)

2:10 Hydraulic Fracturing Geochemical Impact on Fluid Chemistry: Comparing Wolfcamp Shale and Marcellus Shale
W. Xiong, J. Moore, D. Crandall, C. Lopano, A. Hakala
(1Leidos Research Support Team; 2National Energy Technology Laboratory; 3Battelle Research Support Services)

2:30 A Novel Method to Develop Chemostratigraphy Using X-Ray Fluorescence Spectra Raw Data
M. Hussain, A. Amour, K. Al-Ramadan, L. Babalola, J. Humphrey
(1Baker Hughes; 2KUFPM)

2:50 Brittleness and Geomechanical Properties Estimation Using Wireline and Seismic Data in the Duvernay Shale Basin, Canada
C. C. Dumitrescu (Terra-IQ Ltd.)

3:10 Linking Depositional Environment Interpretations and Stratigraphic Architecture to Source Rock Richness and Mechanical Property Distribution in the Delaware Basin, Southeast New Mexico and West Texas
B. Price, R. Domissire, X. Janson
(1University of Texas at Austin; 2Bureau of Economic Geology)

Theme 15: Unlocking the Production and Recovery Potential of Unconventionals
Online Only
Chairs: S. Yi, F. Nath
1:45 Introductory Remarks
1:50 Impact of Huff n Puff EOR on Shale Microstructure
S. Mamoudou, C. Tinni, C. Sondergeld, C. Rai, M. Curtis
(University of Oklahoma)

2:10 CO2-Soluble Surfactants for Enhanced Oil Recovery From Shale
(1National Energy Technology Laboratory; 2Oak Ridge Institute for Science and Education; 3Leidos Research Support Team; 4Dept. of Chemical and Petroleum Eng., University of Pittsburgh; 5Chem. Eng. Tech., College of Technological Studies)

2:30 Water-Oil Displacement in Shale: New Insights From Integrated Imbibition Test and Multi-Scale Imaging
S. Peng, P. Periwal, R. Reed
(University of Texas at Austin)

2:50 Effect of Pore Geometry and Heterogeneous Surface Wettability on the Nanopore Confined Phase Behavior in Nanopore Networks of Shale Rocks
S. Chen, J. Jiang, B. Guo
(1University of Arizona; 2Chevron Energy Technology Co.)

Theme 1: Parent-Child and Well Spacing
Online Only
Chairs: A. L. Lerza, T. Watson
4:05 Introductory Remarks
4:10 Understanding the Interaction Between Parent and Child Using Analytical and Numerical Approaches in Permian Basin - An Operator Perspective
S. Esmaili, J. Deng, E. Wolfram, V. Muradlidan, I. Harmawan, J. Cassanelli
(1Occidental)

4:30 Multi-Disciplinary Fracture and Spacing Study in the DJ Basin
J. Brand, J. Barhaug, R. Reinmiller, R. Parker, B. Cherian
(1Great Western Petroleum; 2Borehole Image Specialists; 3Premier Oilfield Group)

ALT

The Unconventional Reservoir Development Performance Reviews - The Northern Midland Basin Case Study
H. Xiong, A. Thompson, J. Tackett, M. Schellstede
(University of Southern California)

*Denotes presenter other than first author | Green icon denotes a team presentation

ALT = Alternate speaker
IN PERSON

MONDAY TECHNICAL PROGRAM

Special Session: Hydraulic Fracturing Test Site-2 Part II
Room 360
Chairs: V. Sahni, D. Craig, G. Covatch
1:45 pm–3:40 pm (See page 14 for summary)
• Fracture Description of the HFTS-2 Slant Core, Delaware Basin, West Texas; J. F. W. Gale, S. J. Elliott, B. G. Rysak, C. L. Ginn, N. Zhang, R. D. Myers, S. E. Laubach (The University of Texas at Austin); Occidental Petroleum Corporation; Devon Energy; ExxonMobil Upstream Research Company)
• Microseismic at HFTS2: A Story of Three Stimulated Wells V. Grechka, C. Straus, B. Howell, D. Furtado, Z. Li (Borehole Seismic)
• Mechanism of Microseismic Generation During Hydraulic Fracturing - With Evidence from HFTS 2 Observations; Y. Tan, J. Wang, P. Rijken, Z. Zhang, Z. Fang, R. Wu, L. Lim Chen Ning, X. Liu (Chevron)
• HFTS-2 Completions Design and State-of-the-Art Diagnostics Results N. Zakhour, M. Jones, Y. Zhao, K. Orsini, V. Sahni (Occidental)

Theme 1: Optimizing Development Strategies II
Room 351
Chairs: C. Cipolla, J. Alvarez
1:45 Introductory Remarks
1:50 Maximizing Project Value in Vaca Muerta Shale Formation, Part 2: Simultaneous Optimization of Well Space and Completion Design - Case of Study A. Lerza, S. Cuervo, S. Malhotra (Chevron Corporation)
2:40 Simul-Frac Journey in the Permian Basin A. S. Kim, S. Han, K. Belcourt, A. Ruhl, R. Cazenave (Chevron)

Theme 2: Advances in Special Core Analysis and Core-Flood Testing
Room 361
Chairs: L. Jin, V. Montoya
1:45 Introductory Remarks
1:50 Live Oil and Methane Production From Fractured Shale Cores N. J. Welch, M. Meng, W. Li, L. P. Frash, A. Meneneef, S. Peterson, M. Wigan, J. W. Carey (Los Alamos National Lab; Chevron Energy Technology Company)
2:15 Investigation of Diffusion and Sorption in Shale Under Variable Net Stress; Y. Lyu, D. Dasani, T. Tsetsis, K. Jessen (University of Southern California)
2:40 Using NMR and Steady State Permeability Measurements to Study Drilling Fluid Invasion Into the Tight Mississippian Ratcliffe Carbonate and Its Impact on Oil Production A. Mathur, S. Ali, C. Woodland, K. Hudson, C. Barnes, W. D. Von Gonten, J. T. Belcourt, C. Belanger (WDVG Laboratories; Mercury Resources LLC)

Theme 5: Experimental Rock Mechanics II
Room 371
Chairs: L. Louis, J. Kessler, D. N. Espinoza
1:45 Introductory Remarks
1:50 Investigation Into the Fabric and Textural Controls Over Effective Grain Stiffness for Accurate Biot Coefficient and Pore Compressibility Predictions L. Louis, G. Boitnott, E. Hutto, G. Carpio, M. Foster (New England Research; Halliburton)
2:15 Laboratory Study Shows How Real Perforations Affect Unconventional Fracture Initiation F. H. C. Doormbosch, Q. Guo, C. E. Felicio Guedes, C. E. Baumann, B. D. Clark (Schlumberger)
2:40 Triaxial Direct-Shear Reveals the True Magnitude of Fracture Roughness Effects on Flow; M. MENG, L. Frash, J. W. Carey, N. J. Welch, W. Li, S. K. Peterson (Los Alamos National Laboratory)
3:05 Mitigating the Effect of Ash Layers on Hydraulic Fracture Connectivity B. Abelli, R. Suarez-Rivera, J. T. Mayo (W.D. Von Gonten Laboratories; Intrepid Resources)

Theme 6: Advances in Applied Petroleum Geochemistry and its Applications
Exhibit Hall - Station B
Chairs: J. Jweda, C. Barrie
1:45 Introductory Remarks
1:50 Produced Gas and Condensate Geochemistry of the Marcellus Formation: Insights into Petroleum Maturity, Migration, and Alteration in an Unconventional Shale Reservoir C. D. Laughrey (Stratum Reservoir)
1:50 Raman Microscopy Analysis of Wyoming CarbonSAFE Pilot Well Thin Sections for Mineralogy and Organic Matter Characterization; G. A. Myers, T. Brown, S. Fernando, E. Phillips, F. McLaughlin (WellDog Gas Sensing Technology Corp; University of Wyoming)

Theme 9: EUR and Performance Prediction - DCA and Beyond II
Room 362
Chairs: A. Ramkhelawon, T. Oluokun, S. Matringe
1:45 Introductory Remarks
1:50 Continuous Lookback, Calibration, and Adjustment Reduces Biases and Improves Reliability of Production Forecasts M. K. Alarfaj, D. A. McVay (Armaco; Texas A&M University)
2:15 Deconvolution of Time-Varying Bottomhole Pressure Improves Rate-Time Models History Matches and Forecasts of Tight-Oil Wells Production; L. M. Ruiz Maraggi, L. W. Lake, M. P. Walsh (The University of Texas at Austin)
2:40 The Utilization of the “Rate-Integral” to Assist with Decline Curve Analysis of Poor-Quality Unconventional Time-Rate Data E. W. Bryan, D. Symmons, D. Ikik, T. A. Blasingame (Texas A&M University – Now DeGolyer and MacNaughton; DeGolyer and MacNaughton; Texas A&M University)

Theme 11: International and Emerging Challenges of Unconventional Resources: Integrated Geoscience and Engineering
Room 370
Chairs: D. J. Livasy, T. Mallinson
1:45 Introductory Remarks
1:50 Subsurface Technology Sharing from Oil and Gas to Geothermal Resources B. Dindoruk, S. Livescu (University of Houston; Baker Hughes)
2:15 Efficient Modeling of Enhanced Geothermal System with 3-D Complex Hydraulic and Natural Fractures W. Yu (UT-Austin and Sim Tech LLC)
2:40 Stacked Completion and Production of Lacustrine Shale Oil Deposit Lateral Wells in the Kongdian Formation, China P. Zhao, G. Wen, T. Ni, H. Chen, H. Yuan, L. Yang, S. Wu (PetroChina Dagang Oilfield Company; Solid Services; Power Energy and Environmental Research Institute)

*Denotes presenter other than first author | Green icon denotes a team presentation
MONDAY TECHNICAL PROGRAM

**Theme 1: Focus on Methane: Produced Water and Induced Seismicity**
*Exhibit Hall - Station A*

1:45 **Introductory Remarks**

1:50 **Well Development, Production, & Challenges in the Lewis Shale, Wyoming**
L. C. Mayorga-Gonzalez, S. A. Sonnenberg (Colorado School of Mines)

2:15 **Managing Climate Related Risk Through Continuous Methane Monitoring**
A. J. Morris, K. Soofi, D. Camille (ConocoPhillips)

2:40 **Completion Design Evolution for Saltwater Disposal Injection Wells in the Bakken Play**
D. Schmidt, J. W. Bader, A. Day, M. Bohrer (Energy & Environmental Research Center; Department of Mineral Resources)

3:05 **New Technology Closes Micro-Annular Flow Paths in the Wellbore, Stopping Downhole Gas from Escaping to the Surface**
C. Green, R. Evans, B. Fry, W. S. Wruck (Renegade Services)

**Theme 4: Reservoir Characterization Using Petrophysics, Geomechanics, and Microseismic**
*Exhibit Hall - Station A*

4:10 **Introductory Remarks**

4:35 **Improving Microseismic Denoising Using 4-D (Temporal) Tensors and High-Order Singular Value Decomposition**
K. Gonzalez, E. Gildin, R. Gibson (Texas A&M University; NanoSeis)

4:40 **An Integrated Analytics and Machine Learning Solution for Predicting the Anisotropic Static Geomechanical Properties of the Tuscaloosa Marine Shale**
C. M. Ruse, J. Ahmadov, N. Liu, M. Mokhtari (University of Louisiana at Lafayette)

Panel Session: Data Issues: Management, Integrity, and Legacy

**General Assembly**

Moderator: I. Aviles

4:05 pm-5:25 pm (See page 13 for summary)

- P. Nerl, Energistics
- E. Zavala, Delek
- K. Padeletti, Amazon Web Services, Houston
- P. Jong, Shell Global Solutions Inc.
- J. Fan, Deeptime Digital Earth
- J. Cruise, Schlumberger

**Special Session: Hydraulic Fracturing Test Site-2 Part III**
*Room 360*

Chairs: V. Sahni, D. Craig, G. Covatch

4:05 pm-5:35 pm (See page 14 for summary)

- **An Integrated View of Hydraulic Induced Fracture Geometry in Hydraulic Fracture Test Site 2**
  G. A. Ugoeto, M. Wojtaszek, P. T. Huckabe, A. A. Savitski, A. Gzuk, G. Jin, J. A. Chavarria, K. Haustveit (Shell Exploration & Production Company; BSP; Neubrex; Neubrex Consultant and Colorado School of Mines; OptaSense; Devon Energy)

- **Hydraulic Fracture Characterization by Integrating Multidisciplinary Data From the Hydraulic Fracturing Test Site (HFTS-2)**
  Z. Zhang, J. DiSiena, D. Bevc, L. Jin, J. A. Chavarria, J. Spies (Texas A&M; NexTier Oilfield Solutions)

- **Analysis of Completion Design Impact on Cluster Efficiency and Pressure-Based Well Communication in HFTS-2 Delaware Basin**
  A. Vissotski, A. Singh, P. Rijken, R. Reverol (Chevron)

**Theme 2: Drivers for Understanding Reservoir Quality and Completion Quality**
*Room 361*

Chairs: C. Glaser, M. Luycz

4:05 **Introductory Remarks**

4:10 **Direct Measurement of Permeability and Its Evolution With Stress**
D. Gokaraju, O. Djordjevic, D. Gokaraju, L. Hathorn, A. Gudez, R. Patterson, A. Simon, M. Aldin, S. Aldin, A. Thambare, S. Govindarajan (MetaRock Laboratories; Ovintiv; University of Houston; Independent, previously with MetaRock Laboratories)

4:35 **Wettability Alteration and Improved Oil Recovery in Unconventional Resources**
F. Bordeux Rego, E. Eltahan, K. Sepehrnoori (The University of Texas at Austin)

5:00 **Not All Shales Play the Same Game: Comparative Analysis of US Shale Oil Formations by Reverse Engineering and Petroleum Systems**
R. Sorkhabi, P. Panja (University of Utah)

**Theme 5: Hydraulic Fracturing: Monitoring, Modeling, and Analysis I**
*Room 371*

Chairs: K. Wu, A. Singh

4:05 **Introductory Remarks**

4:10 **Mechanical Stratigraphy Modeling, the Foundation of Unconventional Geomechanical Analysis**
R. Bradley, V. Mostafavi (ConocoPhillips)

4:35 **A Geomechanical Analysis of Shale Hydraulic Fracturing Containment**
A. Kamali, A. Ghassemi (University of Oklahoma)

5:00 **Quasi-Static Fracture Height Growth in Laminated Reservoirs: Impacts of Stress and Toughness Barriers, Horizontal Well Landing Depth, and Fracturing Fluid Density**
M. Mehrabi, Y. Pei, M. Haddad, F. Jawadpour, K. Sepehrnoori (The University of Texas at Austin)

**Theme 8: Eagle Ford**
*Room 370*

Chairs: H. Kalaei, H. Evans

4:05 **Introductory Remarks**

4:10 **Multi-Well Modeling in the Eagle Ford: An Investigation of Redevelopment, Infill, and Refrac Opportunities**
C. Karacaner, E. Agarstan, P. Chapman, J. Roberts, D. Glazier, C. Ozgun (NITEC LLC; Devon Energy)

4:35 **Experimental Study of Hydrocarbon Vaporization for EOR Applications in Shales**
J. Odiachi, F. Cruz, A. Tinnini, C. Sonderegard, C. Rai (University of Oklahoma)

5:00 **A Simulation Study to Evaluate Operational Parameter Ranges for a Successful Cyclic Gas Injection in Different Areas of Eagle Ford**
M. Gaddipati, B. Basbug, T. Firincioglu (NITEC LLC)

5:25 **Extending the Effective Fracture Lengths Through Mitigation of Water Trapping to Improve Eagle Ford Gas Production**
L. Jin, B. Spies, S. Rahagopalan (Alchemy Sciences Inc.; Agern Energy LLC)

**Theme 10: Innovative Technologies to Reduce Completions Costs**
*Room 351*

Chairs: A. Recio, I. W. R. Saputra

4:05 **Introductory Remarks**

4:10 **Investigating Effects of Adding Surfactant to Cement Spacer on Mud Removal Performance and Cement Bond with Formation - An Experimental Study**
A. Mansour, T. Gamadi, H. Emadibakabei, O. Algadi, S. Kakardjian (Texas Tech University; NexTier Oilfield Solutions)

4:35 **Case Study of a Wireline Deployable Spearhead Acid in the Denver-Julesburg Basin**
K. Yocham, D. Allison, M. Schwartz (Fluid Energy Group Ltd.; Highpoint Resources Corporation)

5:00 **Efficient Prediction of Proppant Placement Along a Horizontal Fracturing Stage for Perforation Design Optimization**
J. Wang, A. K. Singh, X. Liu, M. C. Rijken, Y. Tan, S. Naik (Chevron Technical Center)

*Denotes presenter other than first author | Green icon denotes a team presentation
TUESDAY TECHNICAL PROGRAM

IN PERSON

Panel Session: ESG in Action: Flare Reduction, Leak Detection, Logistics, Blended Solar/Geothermal/Wind Electricity Generation Projects, and Social License to Operate

General Assembly
Moderator: K. Yared
8:25 am–10:10 am (See page 15 for summary)
• S. Dyer, Schlumberger
• A. Scott, Project Canary
• V. Ryan, Chevron
• B. Dindoruk, University of Houston
• H. Soroush, PETROLERN LLC

Special Session: Hydraulic Fracturing Test Site-2 Part IV

Room 360
Chairs: G. Ugueto, J. Ciezobka
8:25 am–10:20 am (See page 16 for summary)
• Observations and Modeling of Fiber-Optics Strain on Hydraulic Fracture Height Growth in HFTS-2
J. Wang, Y. Tan, P. Rijken, X. Liu, A. Singh, Y. Li (Chevron)
• A New Fracture Diagnostic Tool for Unconventional Cells: High Resolution Distributed Strain Sensing via Rayleigh Frequency Shift during Production in Hydraulic Fracture Test 2
G. Ugueto¹, M. Wojtaszek², S. Mondal¹, A. Gzuk¹, D. Jurick³, G. Jin¹ (¹Shell Exploration & Production Company; ²BSP; ³Neubrex; ⁴Colorado School of Mines)
• A Systematic Interpretation of Subsurface Proppant Concentration from Drilling Mud Returns: Case Study from Hydraulic Fracturing Test Site (HFTS-2) in Delaware Basin
D. Maity, J. Ciezobka (Gas Technology Institute)
• Analysis and Integration of the Hydraulic Fracturing Test Site -2 (HFTS-2) Comprehensive Dataset
V. S. Pudugramam, Y. Zhao, F. Bessa, J. Li, N. Zakhour, T. Brown, J. Han, I. Harmawan, V. Sahni (Occidental)

Special Session: Best of ARMA

Room 370
Chairs: A. Ghassemi, J. McLennan
8:25 am–10:10 am (See page 16 for summary)
• Mitigating Hydraulic Fracture Induced Seismicity; S. Maxwell, Ovintiv
• Hydraulic Fracture Design Needs Beyond Achieving Short-Term Production Metrics; M. Pearson, Liberty Resources
• Completions-Induced Casing Deformations in Unconventionals: What We Think We Know; N. N. Nagel, Oilfield Geomechanics LLC
• Managing Induced Seismicity on Pre-Existing Faults During Hydraulic Fracture Stimulation; D. Walters, B. Yang, TRS Energy Consultants Ltd

Theme 1: Permian Stacked Pay Development Strategies

Room 351
Chairs: R. A. Hull, S. Szlendak
8:25 Introductory Remarks
8:30 New Insights into Hydraulic Fracture Dynamics: Learnings from a Pressure Monitoring Well in the Permian Basin
V. Muralidharan, S. Esmaii (Occidental Petroleum Corporation)
9:20 Impact of Completion Design on Various Infill Scenarios: A Data Driven Permian Case Study
C. Darneal, K. Friehauf, K. McClain, H. Zhou, P. Hoang, B. Rajappa, J. Hammond, H. Swan (ConocoPhillips)

Theme 2: High and Low Field NMR Applications

Room 361
Chairs: H. Wang, H. Xie
8:25 Introductory Remarks
8:30 Log and Core NMR T1T2 and T2D Mapping of the Bakken Reservoir Complex; R. Merkel¹, M. Stephens¹, C. Thompson², K. McLean³ (¹Denver Petrophysics LLC; ²Crescent Point Energy; ³Emerson Paradigm)
8:55 Measurement of Effective Tortuosity in Unconventional Tight Rock Using Nuclear Magnetic Resonance; S. Dang, S. Mukherjee, C. Sonderegger, C. Rai (University of Oklahoma)
9:20 NMR Quantification of Wettability and Water Uptake in Unconventionals; D. Veselinovic¹, M. Dick¹, R. Bonnie³, S. Kelly² (¹Green Imaging Technologies; ²ConocoPhillips; ³Continental Resources; ⁴Epoch Consulting LLC)

Theme 4: EUR and Performance Prediction and Type Well Profiles

Room 371
Chairs: K. Wu, O. Beltran, K. Ramurthy
8:25 Introductory Remarks
8:30 Physics-Based and Data-Driven Models to Predict Production Drivers in the Vaca Muerta Formation; L. Cruz, J. Ochoa (Equinor)
8:55 Valuating the Effect of Formation Properties and Completion Design Parameters on Cluster Efficiency Using Advanced Modeling; V. Sesetty, A. Ghassemi (University of Oklahoma)
9:20 Modeling and Optimization of Proppant Distributions in Multicluster Hydraulic Fracture-Natural Fracture (HF-NF) Networks; Y. Wu, G. J. Moridis, T. A. Blasingame (Texas A&M University)
9:45 Numerical Simulation of Proppant Transport and Deposition in Complex Hydraulic-Natural Fracture Networks; D. Kumar, B. Liu, A. Ghassemi (University of Oklahoma)

Theme 5: Hydraulic Fracturing: Monitoring, Modeling, and Analysis II

Room 379
Chairs: K. Wu, O. Beltran, K. Ramurthy
8:25 Introductory Remarks
8:30 A Physically Consistent Approach to Delivering the Best Production Performance for Shale Oil and Gas Wells; E. L. Dougherty¹, T. Blasingame³ (¹University of Southern California; ²Texas A & M University)
8:55 Forecasting Production of Tight-Oil Wells; A. Physically Consistent Decline Analysis Method for Unconventional Wells; J. A. Acuna (Chevron)
9:20 Using Bayesian Leave-One-Out and Leave-Future-Out Cross-Validation to Evaluate the Performance of Rate-Time Models to Forecast Production of Tight-Oil Wells; L. M. Ruiz Maraggi, L. W. Lake, M. P. Walsh (The University of Texas at Austin)
9:45 Type Wells—A Physics-Blind Statistical Myth? Our RTA-Driven Construction Methodology Proves Otherwise! S. Sukumar, J. W. Lee (Texas A&M University)

Theme 6: Data-Driven Forecasting and Combining Physics-Based and Machine-Learning Methods

Exhibit Hall - Station A
Chairs: A. Bailey, N. Nizamidin
9:40 Introductory Remarks

Tuesday In Person continued on page 34

*Denotes presenter other than first author | Green icon denotes a team presentation
ONLINE ONLY

Theme 15: Evaluating and Applying Advanced Methods to Create Value in Unconventionals
Online Only
Chairs: D. Walker, X. Hu
8:25 Introductory Remarks
8:30 Ordovician Source Rock Potential on the Broome Platform of the Onshore Canning Basin in the Far North of Western Australia
J. L. van Hattem (Theia Energy Pty Ltd)
8:50 Credible Inventory Characterizations: Earning Back Trust in an Abandoned Market Sector
D. P. B. Allen (Consultant)
9:10 Experimental Controls on the Transition Between Planar and Branched Hydraulic Fractures
W. Li, L. Frash, J. W. Carey, M. Meng, N. Welch, H. Viswanathan (Los Alamos National Laboratory)
9:30 Controlling Strontium Scaling in the Permian Basin Through Manipulation of Base Fluid Chemistry and Additives
E. Spielman-Sun1, A. B. Jew1, J. L. Druhan2, J. R. Bargari1 (*SLAC National Accelerator Laboratory; 2University of Illinois at Urbana-Champaign)
9:50 An Analytical Rate-Transient Analysis Model in Unconventional Light Oil Reservoirs: Exhibiting Reservoir Heterogeneity and Multiphase Flow
J. Li1, B. Yuan1, C. R. Clarkson2, X. Zhu1, Y. Li1 (*China University of Petroleum; 2The University of Calgary)

Theme 4: Measuring Stress, Strain, and Pressure
Online Only
Chairs: M. Rauch, A. Munoz
10:45 Introductory Remarks
10:50 A New Pore Pressure Prediction Model for Naturally Fractured Shales and Stacked Plays: The Effect of Active Hydrocarbon Generation - A Powder River Basin Case Study
D. Orozco, R. Aguilera (University of Calgary)
11:10 Relating Microseismicity to Geomechanical Strain
A. M. Baig, B. Witten, A. Booterbaugh (Nanometrics)

Topical Luncheon: Energy 4.0: How to Design a Future-Proof Digital Asset that Hits the Financial Bottom Line
Online Only
12:15 pm - 1:30 pm (See page 17 for summary)
  - S. Paranj; Xecta Labs

Topical Luncheon: Environmental, Social and Corporate Governance: A Different Take
Online Only
12:15 pm - 1:30 pm (See page 17 for summary)
  - C. Wright; Liberty Frac

Theme 8: Improving Recovery From Flowback to EOR Potential
Online Only
Chairs: J. Jalali, A. Shannon
1:45 Introductory Remarks
1:50 Flowback Strategy Optimization for Permian Unconventional Bone Spring Sands and Wolfcamp Wells
X. Xie, S. Amadi, C. Leiker, S. Liu, E. Kinzler, M. Han, M. Melendez Castillo, S. P. Rivera (Occidental)
2:10 Comparison of CO2 and Lean Gas Cyclic Injection (‘Huff-n-Puff’) in Artificially-Fractured Shale Core Samples
C. Song, C. R. Clarkson, H. Hamdi, A. Ghanizadeh (University of Calgary)
2:30 Fracturing Fluid Loss in Unconventional Reservoirs: Evaluating the Impact of Osmotic Pressure and Surfactant and Methods to Upscale Results
B. Pan, C. R. Clarkson, A. Younis, C. Song, C. Debuhr, A. Ghanizadeh, V. I. Birss (University of Calgary)

2:50 Innovative Modeling to Quantify the Impact of Natural Fractures, Optimize Well Spacing, and Increase Productivity in the Marcellus Shale
F. Mohamed1, D. Otulana1, I. Salazar1, H. Xue1, L. Fan1, D. Shan2, J. Bennett3, K. Abubakar3, K. Barrie3, B. Yeager3, M. Simpson3, C. Jenkins4 (*Schlumberger; *Independent; *Chief Oil and Gas; *Rose and Associates)

Theme 15: Novel Completion Methods to Optimize Costs and Maximize Recovery
Online Only
Chairs: D. L. Lougheed, F. Male
1:45 Introductory Remarks
1:50 Optimizing The Selection and Application of Chemical Additives in Shale Reservoirs
J. Yan1, W. Wang1, W. Wei1, G. Winslow2 (*Chevron; 2Chevron, Houston)
2:10 Systematic Comparison of Proppant Placement in SRV Along Two Fractured Wells at the Hydraulic Fracturing Test Site: A Case Study from Midland Basin
D. Maity, J. Ciezobka (Gas Technology Institute)
2:30 Predicting Estimated Ultimate Recovery from Flowing Material Balance Analysis Considering Rock and Conannate Water Expansion for Unconventional Gas Reservoirs
A. Atadeger1, M. Onur1, L. G. Thompson2, B. A. Ruddick2 (*The University of Tulsa; 2Cimarex Energy Company)
2:50 Predictive Analysis of Well Interference in Tight Oil Reservoirs
S. Tavassoli1, E. Eltahan1, K. Smye1, G. McDaid1, E. Goodman1 (*Bureau of Economic Geology; 2The University of Texas at Austin)

Theme 2: Pore-Network Imaging and Fluid Flow Modeling
Online Only
Chairs: J. Schembre-McCabe, B. Sarmah
4:05 Introductory Remarks
Z. Yang, C. Clarkson, A. Ghanizadeh (University of Calgary)
4:50 Evaluation of Electron Tomography Reconstruction Methods for a Barnett Shale
L. Froué, E. Boigné, M. Ihme, A. R. Kovscek (Stanford University)

Theme 7: Machine-Learning for Subsurface Applications
Online Only
Chairs: M. Ashby, S. Matringe, B. Dindoruk
4:05 Introductory Remarks
4:10 Statistical Analysis of Fractures From the Hydraulic Fracture Test Site 1
F. Male1, B. Rysak2, R. Dommisse3 (*UT Austin Center for Subsurface Energy and the Environment; 2The University of Texas at Austin; 3UT Austin Bureau of Economic Geology)
4:30 Vision-Based Sedimentary Structure Identification of Core Images Using Transfer Learning and Convolutional Neural Network Approach
B. Zhang1, S. Chen1, Y. Xiao1, L. Zhang2, C. Wang2 (*Petroleum Exploration and Production Research Institute, SINOPEC; 3China University of Geosciences)
4:50 Machine Learning Applications for a Quantitative Evaluation of the Fracture Network in the Wolfcamp Shale Using Tracer and Completion Data
A. Kumar, C. Shih, G. Liu, R. Hammack, J. Ilconich, G. Bromhal (National Energy Technology Laboratory)
ALT Deep Learning for Quantitative Hydraulic Fracture Profiling From Fiber Optic Measurements
W. Li1, H. Lu2, Y. Jing1, F. Hveding2 (*Aramco Houston Research Center; 2University of Houston; 3Saudi Aramco)
ALT Do We Really Need Deep Learning? A Study on Play Identification Using SEM Images
H. Zhang, M. T. Kasumov, D. Devegowda*, M. E. Curtis (University of Oklahoma)
Theme 1: Optimizing Completions, Perforations, and Stimulation Strategies
Room 351
Chairs: K. Dianiska, L. Baez, W. Wu
10:45 Introductory Remarks
10:50 Constant Concentration Proppant Schedules for Slickwater Frac Design in Unconventional Resources; A. Singh, S. Malhotra, D. Wehunt, S. Han, C. Lannen, X. Liu, J. Cooper, A. Kim (Chevron)
11:15 Simple Yet Practical Production Data Characteristics of Cluster Spacing and Stage Length Configurations: A Permian Case Study; S. Esmali, N. Zakhour, J. Deng (Occidental)
11:40 Integration of Geology, Geomechanics, and Completion Data in Modeling for Future Well and Completion Optimization: An Unconventional Diyarab Case Study; H. Pourpak, W. Newby, S. Taubert, H. Al Marzoqui, M. Z. Baig, A. Lefebvre-Prudencio, Y. Wu, C. Pointer, F. Cafardi, V. De Gennaro, L. Nistor (TotalEnergies; ADNOC; Schlumberger)

Theme 2: Emerging Geological Evaluations, Tools and Workflows: Data Driven Methods
Room 361
Chairs: E. I. Velez, B. Hill, S. I. Goetan
10:45 Introductory Remarks
10:50 Unlocking the Human Factor: Geosteering Decision Making as a Component of Drilling Operational Efficiency; A. Tadjer, S. Alyaev, D. Minen, I. Kuvai (University of Stavanger; NFRCE Norwegian Research Centre; ROGIL)
11:40 Real-Time Analysis of Rig-Site Drilling Data Using Automated System to Assist Geosteering and Completion Decision Making; M. Ghazizadeh, A. Khodabakhshnejad, D. Lowrie (DrillApp Technologies; Core Geologic, Inc.)

Theme 3: Hydraulic Fracturing: Monitoring, Modeling, and Analysis III
Room 371
Chairs: A. Ghassemi, O. Beltran, K. Ramurthy
10:45 Introductory Remarks
10:50 Propagating of Hydraulic Fractures from Horizontal Wellbores: Effects of In-Situ Stress and Near Wellbore Stress Redistribution; Q. Gao, D. Zhou, A. Ghassemi, X. Liu, Y. Liu, M. Guo (Xi’an Shiyou University; The University of Oklahoma; Northwest University)
11:40 A Novel Workflow from StimPlan to EDFM for Complex Hydraulic Fracture Modeling and Production Simulation; Y. Yan, J. Deng, D. Guerra, W. Yu, J. Miao (SimTech LLC; NSI Technologies LLC; The University of Texas at Austin)

Theme 4: Facilities and Artificial Lift
Room 370
Chairs: R. Kou, D. Ooi, A. Ramkhelawan
10:45 Introductory Remarks
10:50 Automating Chemical Injection: A Pilot Field Trial in the Delaware; S. L. Scott, N. Lehman, J. Harris, M. Garcia, T. Lackey (ConocoPhillips)
11:15 Coupling Physics-Based Full Field Hydraulic Model with Advanced Data Analytics: Evolution of Surface Pipeline Operations; L. Donnelly, M. Albers, J. Cameron, K. Frame, K. Zhang, H. Liu, S. Atmaca, N. Rodriguez (ConocoPhillips; Schlumberger)
### Theme 2: Rock-Fluid and Fluid-Fluid Interactions - PVT Data

**Acquisition/Analysis**

**Room 361**

**Chairs:** L. Baez, K. Jerath

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| 1:50  | Core-Flood EFFluent and Shale Surface Chemistries in Predicting Interaction Between Shale, Brine, and Reactive Fluids
A. S. Gundogar*1, J. L. Druhan, C. M. Ross*, A. D. Jew*, J. R. Bargar*, A. R. Kovscek* (SLAC National Accelerator Laboratory; Stanford University; University of Illinois at Urbana-Champaign)

2:15 | Comprehensive Laboratory Testing for Screening Completion Fluids to Maximize Productivity of Hydraulically Fractured Reservoirs

2:40 | Rethinking Mineral Scaling: What, Where, and Why is it occurring in the Stimulated Rock Volume
A. Jew*, J. R. Bargar*, J. Brownlow*, M. Laughland* (SLAC National Accelerator Laboratory; Pioneer Natural Resources; Stratum Reservoir)

3:05 | Molecular Simulation of Multi-Scale Multi-Component Hydrocarbon Phase Behavior in Liquid-Rich Shale Reservoirs
F. Chen, R. Bi, H. Nasrabadi (Texas A&M University) |

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### Theme 3: Reservoir Characterization, Geological Evaluations, and Studies of Unconventional Plays

**Exhibit Hall - Station A**

**Chairs:** S. Rudolph, A. Viswanathan

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| 1:50  | Geostatistical Simulation of Facies and Petrophysical Properties for Heterogeneity Modeling in A Tidal Depositional Environment: A Case Study From Upper Shale Member in A Southern Iraqi Oil Field
W. J. Al-Mudhafar (Basrah Oil Company)

2:15 | A Principal Component Analysis Approach to Understanding Relationships Between Elemental Geochemistry Data and Deposition, Niobrara Formation, Denver Basin, CO
R. S. ElGhonimy*, (bp; Colorado School of Mines) |

### Theme 4: Diagnostics and Monitoring with Geomechanical Models

**Room 371**

**Chairs:** C. L. Ginn, A. Thombare

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| 1:50  | Evaluation and Insights from Instantaneous Shut-In Pressures

2:40 | Quantification of Thermal Effects on Cross-Well Low-Frequency Distributed Acoustic Sensing Measurements
Y. Liu*, K. Wu*, G. Jin*, G. Moridis* (Texas A&M University; Colorado School of Mines; Lawrence Berkeley National Laboratory)

3:05 | Quantitative Assessment of Induced Seismicity from Hydrocarbon Production and Produced Water Disposal in Azle Area, North Texas; J. Park*, R. Chens*, A. Datta-Gupta*, S. Lele*, T. Tyrrell (Texas A&M University; ExxonMobil; XTO Energy) |

### Theme 5: Diagnostics and Monitoring with Geomechanical Models

**Room 370**

**Chairs:** C. Donohue, M. Formolo, S. Macalello

<table>
<thead>
<tr>
<th>Time</th>
<th>Session Details</th>
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<tbody>
<tr>
<td>1:45</td>
<td>Introductory Remarks</td>
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</table>

P. Jones*, D. Dressler*, T. Conner*, J. O’Brien*, T. Klaassen*, S. Bingham* (Consulting Geochemist, Devon Energy; Devon Energy; Devon Energy (former); Department of Geology and Geography, Auburn University)


3:05 | Machine-Learning Assisted Production Allocation Using A 3-Dimensional Full Field Geochemical Model of Produced Oils in the Eagle Ford and Austin Chalk of South Texas
J. Jweda, E. Michael (ConocoPhillips) |

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*Denotes presenter other than first author | Green icon denotes a team presentation
### TUESDAY TECHNICAL PROGRAM

#### IN PERSON

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<td><strong>Chairs:</strong> K. Scott, H. Sun</td>
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<td><strong>4:05</strong></td>
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<td><strong>Introductory Remarks</strong></td>
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<td><strong>4:10</strong></td>
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<tr>
<td><strong>DAS Recorded Body and Tube Wave Generated by Perforation</strong></td>
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<tr>
<td><strong>Shots:</strong> Analysis and Numerical Modeling for Completion</td>
</tr>
<tr>
<td><strong>Monitoring and Reservoir Characterization</strong></td>
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<tr>
<td>S. Zhang, A. Titov, V. Jayaram, H. Bello, R. Hurt, G. Jin</td>
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<tr>
<td>(Pioneer Natural Resources; <em>Colorado School of Mines</em>)</td>
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<td><strong>5:00</strong></td>
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<tr>
<td><strong>Child Well Fracture Sequencing for Improved Production</strong></td>
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<tr>
<td>R. Suarez-Rivera, B. Clark, D. Sassen, C. Quinn</td>
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<tr>
<td>(W.D. Von Gonten Laboratories; <em>Sabalo Energy LLC</em>)</td>
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<tr>
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<td><strong>Chairs:</strong> A. Tinni, J. Salazar</td>
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<td><strong>Introductory Remarks</strong></td>
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<td><strong>4:10</strong></td>
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<tr>
<td><strong>Determination of Pore Fluid Salinity in Tight Rocks</strong></td>
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<td><strong>Without Fluid Extraction</strong></td>
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<tr>
<td>J. Odiachi, A. Tinni</td>
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<tr>
<td>(University of Oklahoma)</td>
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<td><strong>4:35</strong></td>
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<tr>
<td><strong>Determining Organic Kerogen Maturity, Wettability, and</strong></td>
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<td><strong>Productivity From Induction Dielectric, Resistivity,</strong></td>
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<tr>
<td><strong>and Spectroscopy Measurements</strong></td>
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<tr>
<td>J. C. Rasmus, D. Homan, G. L. Wang</td>
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<td>(Retired; <em>Schlumberger</em>)</td>
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<td><strong>5:00</strong></td>
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<tr>
<td><strong>Impact of Kerogen Geochemistry on Methane and Water</strong></td>
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<td><strong>Adsorption Using Molecular Simulations</strong></td>
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<tr>
<td>A. Jagadisan, I. Silveira de Araujo, Z. Heidari</td>
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<tr>
<td>(University of Texas at Austin)</td>
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<tr>
<th>Theme 3: Emerging Geological Evaluations, Tools and Workflows: Examples from the Field and Beyond</th>
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<td><strong>Chairs:</strong> T. Watson, M. Poole, K. McLin</td>
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<tr>
<td><strong>Introductory Remarks</strong></td>
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<td><strong>4:10</strong></td>
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<tr>
<td><strong>Mesoscopic Characterization of the Heterogeneity Within</strong></td>
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<td><strong>Tight Carbonate Gas Reservoir, Outcrop Study, Saudi Arabia</strong></td>
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<tr>
<td>M. S. Osman, O. Abdullatif</td>
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<tr>
<td>(King Fahd University of Petroleum &amp; Minerals)</td>
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<td><strong>4:35</strong></td>
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<tr>
<td><strong>Regional Comparison of the First Depositional Cycle of the</strong></td>
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<td><strong>Vaca Muerta in the Northern and Central Portions of the</strong></td>
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<td><strong>Neuquén Basin.</strong></td>
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<td>J. M. Proctor, D. Acebal, G. Davalos, S. Olmos, J. d’Hiriart</td>
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<td>(Halliburton; <em>Tecpetrol</em>)</td>
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<td><strong>5:00</strong></td>
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<td><strong>Eagle Ford and Bakken Productivity Prediction Using Soil</strong></td>
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<td><strong>Microbial Fingerprinting and Machine Learning</strong></td>
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<td>M. H. A. A. Zip, T. Mallinson, J. Zwaan, A. G. Chitu, P. David</td>
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<td>(*Biodentify; *Aramco Americas; <em>Wintershall Dea</em>)</td>
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<th>Theme 4: Novel Seismic Inversion and Attribute Applications</th>
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<td><strong>Introductory Remarks</strong></td>
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<tr>
<td><strong>Seismic Investigation of Lithological Controls on Effective</strong></td>
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<td>B. N. Goodway</td>
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<td><strong>4:35</strong></td>
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<tr>
<td><strong>Illuminating Fine-Scale Geology and Creating Robust</strong></td>
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<td><strong>Seismic Attributes Using High Trace Density Seismic Data in</strong></td>
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<td><strong>the Midland Basin</strong></td>
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<td>A. Lewis, B. Karr, R. Bianco, S. Pollock</td>
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<td>(*Fairfield Geotecnologies; <em>Fasken Oil and Ranch</em>)</td>
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<td><strong>5:00</strong></td>
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<tr>
<td><strong>Total Organic Carbon Content Estimation of Bakken</strong></td>
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<td><strong>Formation, Kevin-Sunburst Dome, Montana Using Post-Stack</strong></td>
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<td><strong>Inversion, Passey Method and Multi-Attribute Analysis</strong></td>
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<tr>
<td>S. A. Samuel, R. Zhang</td>
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<td>(University of Louisiana at Lafayette)</td>
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### Theme 9: Future of Production Forecasting and Production Diagnostics

**Room 362**

**Chairs:** X. Xue, V. Jayaram, S. Szlendak

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<tr>
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<tr>
<td><strong>4:35</strong></td>
<td><strong>Well Performance and Completion Efficiency Assessment in the Delaware Basin Using Diffusive Time of Flight</strong>, J. Park, Y. Bem, V. Muralidharan (*Texas A&amp;M University; <em>Occidental Petroleum</em>)</td>
</tr>
<tr>
<td><strong>4:10</strong></td>
<td><strong>Impact of Fracture Conductivity on Production - How Much Proppant Do We Really Need in Unconventional Reservoirs?</strong>, S. Naik, A. Singh (<em>Chevron CTC</em>)</td>
</tr>
<tr>
<td><strong>4:35</strong></td>
<td><strong>Fast Probabilistic Forecasting of Oil Production Using Monte Carlo Simulations on Data Driven Acquisition of Decline-Curve Parameter Distributions</strong>, V. B. K. Chavali, W. J. Lee (<em>Texas A&amp;M University</em>)</td>
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</tr>
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### Theme 2: Advanced Formation Evaluation and its Impact in Hydrocarbon Recovery

**Exhibit Hall - Station A**

**Chairs:** N. Chakraborty, A. Posenato Garcia

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<th><strong>Session</strong></th>
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<tr>
<td><strong>1:50</strong></td>
<td><strong>Application of Bayesian Optimized Deep Bi-LSTM Neural Networks for Production Forecasting of Gas Wells in Unconventional Shale Gas Reservoirs</strong>, Y. Kocoglu, S. Gorell, P. McElroy (<em>Texas Tech University</em>)</td>
</tr>
<tr>
<td><strong>1:45</strong></td>
<td><strong>Fast Probabilistic Forecasting of Oil Production Using Monte Carlo Simulations on Data Driven Acquisition of Decline-Curve Parameter Distributions</strong>, V. B. K. Chavali, W. J. Lee (<em>Texas A&amp;M University</em>)</td>
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### Theme 9: EUR and Performance Prediction

**Exhibit Hall - Station B**

**Chairs:** K. Schwartz, Z. Wang, J. Pearson

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<thead>
<tr>
<th><strong>Session</strong></th>
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<tr>
<td><strong>3:40</strong></td>
<td><strong>Well Performance and Completion Efficiency Assessment in the Delaware Basin Using Diffusive Time of Flight</strong>, J. Park, Y. Bem, V. Muralidharan (*Texas A&amp;M University; <em>Occidental Petroleum</em>)</td>
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### Theme 3: Emerging Geological Evaluations, Tools and Workflows: Examples from the Field and Beyond

**Room 360**

**Chairs:** M. Rauch, A. Bailey

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<td><strong>Eagle Ford and Bakken Productivity Prediction Using Soil Microbial Fingerprinting and Machine Learning</strong>, M. H. A. A. Zip, T. Mallinson, J. Zwaan, A. G. Chitu, P. David (*Biodentify; *Aramco Americas; <em>Wintershall Dea</em>)</td>
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**Panel Session: Supply Chains in Energy: Cost Savings, Quality Assurance, 3-D Printing, and Ethical Sourcing**

**General Assembly**

**Moderator:** C. Glaser

*4:05 pm–5:25 pm (See page 16 for summary)*

- A. Scott, Project Canary
- D. Herman, Cordax
- J. Guo, Chevron
- R. Puranik, Worldwide Oilfield Machine
- L. Capper, Energy Makers Advisory Group

*Denotes presenter other than first author | Green icon denotes a team presentation*
Theme 6: Analytical Advances in Applied Petroleum Geochemistry
Room 370
Chairs: H. Carvajal-Ortiz, E. Michael, Y. Wang
4:05 Introductory Remarks
4:10 Stratigraphic Distributions of Volatile Compounds in Samples of the Cretaceous Mowry Shale, Wind River, and Bighorn Basins, Determined by Vacuum Extraction and Cryotrap Mass Spectrometry
C. Smith, M. Smith (Advanced Hydrocarbon Stratigraphy)
4:35 Produced Gas and Condensate Geochemistry of the Marcellus Formation: Insights into Petroleum Maturity, Migration, and Alteration in an Unconventional Shale Reservoir
C. D. Laughrey (Stratum Reservoir)
5:00 Application of Geochemistry to Assessing Refrac Jobs in the Bakken/Three Forks Hybrid Play
H. Long 1, E. Michael 2, Y. Liu 1, N. McMahan 1, A. Farthing 3 (1 ConocoPhillips; 2 ConocoPhillips (retired); 3 ConocoPhillips Company)

Theme 8: Northern Shales
Room 371
Chairs: W. Wang, W. Rahman
4:05 Introductory Remarks
4:10 Bakken Unconventional Well Gas-Oil Ratio (GOR) Behavior Characterization
Y. Liu, B. Coffman, N. McMahan, A. Farthing (ConocoPhillips)
4:35 Effects of Molecular Level Forces on the Diffusivity Characteristics of Hydrocarbons in Shale Reservoirs
Y. Coskuner, X. Yin, E. Ozkan (Colorado School of Mines)
5:00 Quantifying the Diminishing Impact of Completions Over Time Across the Bakken, Eagle Ford, and Wolfcamp Using a Multi-Target Machine Learning Model and SHAP Values
T. Cross, D. Niederhut, A. Cui, K. Sathaye, J. Chaplin (Novi Labs)

*Denotes presenter other than first author | Green icon denotes a team presentation
Panel Session: Assessing Risk and Evaluating Opportunities from Different Perspectives  
General Assembly  
Moderators: I. Aviles and J. Grant  
8:25 am–10:10 am (See page 18 for summary)  
- R. Gilbert, Gilbert Energy  
- R. LeBlanc, IHS Markit  
- J. Grant; Chesapeake  
- P. Sharma; Inveniend  
- N. Jah; Schlumberger

Special Session: DOE Fundamental Shale Research Program I  
Room 360 (Speakers presenting via Zoom)  
Chair: I. Aviles  
8:25 am–10:10 am (See pages 19 and 20 for summary)

Panel 1: Understanding Unconventional Reservoirs: DOE Fundamental Shale Research Program  
- Unlock Nanopores: Fundamental Understanding and Engineering Implications; Y. Wang, Sandia National Laboratories  
- Scale Mineralization in Fracture Faces: Impact of Fluid-Rock Interactions on Permeability; J. Bargar  
- Impact of Reactive Flow Pathway on Permeability Changes Along Primary Fractures; A. Hakala.  
- Incorporating Nanoconfinement Effects into Reservoir Simulators; H. Viewanathan  
- Q&A

Panel 2: Insights on Relationship Between Matrix Geochemistry and Production: From Pores to Fractures  
- Engineering Efficient Frac Geometry for More Efficient and Environmentally Friendly Production; J. Morris  
- Optimization of HProduction from Natural Fractures; B. Carey  
- Proppant Behavior in Fractures - Optimizing Fracture Sustainability; T. Kneafsey  
- The HFTS Project Contribution to Understanding the Multi-Scale Behavior of the Fractured Ultra-Low Permeability Systems: Observations and Practical Implications; G. Moridis  
- Q&A

Theme 3: Structural Geology as Applied in Unconventionals  
Room 351  
Chairs: H. Watkins, B. Hill, J. Hnat  
8:25 Introductory Remarks  
8:30 Delaware Basin Wolfcamp Fm. Maturation and Post-Permian Basin Evolution Based on 2D Restorations and Basin Modeling  
R. Hoar, M. Becker, A. Yu (Texas A&M University)  
8:55 A Streamlined Approach to Fault Stress Analysis and Natural Fracture Prediction  
S. Busetti (Aramco Services Company)  
9:20 Anisotropy in Fracture Networks: Scale-Dependent Clustering and Flow Behavior  
A. Roy, A. K. Sahu (Indian Institute of Technology Kharagpur)  
9:45 Application of Artificial Intelligence Tools for Fault Imaging in an Unconventional Reservoir: A Case Study from the Permian Basin  
H. García, L. Plant (Geoteric)  

Theme 6: Understanding and Predicting Producible Fluids  
Room 371  
Chairs: W. Wang, O. Woodruff, A. Jew  
8:25 Introductory Remarks  
8:30 Identifying the Origin of Large Variations in Gas-Oil Ratios at Horizontal Wells Landed in Upper Wolfcamp Reservoirs in the Delaware Sub-Basin Using Gas Isotope, SARA, and HRGC Data  
J. Adams, A. S. Kornacki (Stratum Reservoir)  
8:55 Left Behind: A Thrilling Post-Expulsion Adventure of Producible Hydrocarbons Remaining in Source Rocks  
S. Wright1, N. J. Hogancamp2, J. G. Guthrie3, J. Wolters1 (Hess Corporation; 1University of Houston; 2Stratum Reservoirs)  
9:20 Determining the Proportions of Producible Oil, Non-Producible Sorbed Petroleum, and Immobile Bitumen in Upper Wolfcamp Core Samples, Delaware Sub-Basin  
A. S. Kornacki (Stratum Reservoir)  
9:45 Hydrocarbon Drainage Index Optimizes Lateral Placement  
R. Schrynemeeckers (Amplified Geochemical Imaging, LLC)  

Theme 10: Friction Reducers and Other Completion Fluids  
Room 361  
Chairs: K. Hoeman, D. N. Benoit, D. Singh  
8:25 Introductory Remarks  
8:30 Experimental investigation of Proppant Placement in Multiple Perforation Clusters for Horizontal Fracturing Applications  
F. Ahmad1, J. Miskimins1, X. Liu2, A. Singh2, J. Wang2 (1Colorado School of Mines; 2Chevron Corporation)  
8:55 Universal Behavior of Polyacrylamide-Based Friction Reducers: Achieving Quantitative Lab Evaluation to Analytical Scale-Up Model Development for Field Performance Prediction  
N. Nizamidin, G. Matovic, D. H. Kim, T. Theriot, H. Linnemeyer, S. Han, T. Malik (Chevron Corporation)  
9:20 Case Study: Boosting Friction Reduction with Surfactant Solutions  
B. Seymour1, A. Phatak1, V. Gupta2, V. Gupta2 (1Stepan Oilfield Solutions; 2APEX Resources)  
9:45 Innovative Cationic Viscoelastic Friction Reducer For Hydraulic Fracturing Application  
F. Malekahmadi1, N. Moringo*, L. Adams1, B. Price1, Y. Li1, S. Kakadjian1, J. Kitchen1, K. Trego2 (1Rockwater Energy Solutions; 2NexTier Oilfield Solutions)

Theme 12: Maximizing and Delivering Value  
Room 370  
Chairs: D. Valleau, L. Baez  
8:25 Introductory Remarks  
8:30 Characterization and Remediation of Scale in Three Horizontal Wells in the Point Pleasant Formation, Appalachia, Pennsylvania  
A. Roberts, E. Fonseca, T. Tekavec (Shell Exploration & Production)  
8:55 A Retrospective Look at Completion Design Optimization Based on Market Conditions  
K. Ferguson1, N. Johnson2, B. Rowley1 (1Universal Pressure Pumping, Inc; 2Pennsylvania General Energy Co., LLC)  
9:20 Machine Learning Methods in the Williston: A Case Study in Productivity Decay and the Implications For Inventory Exhaustion  
B. L. Myers1, R. Duman1, T. Cross2; B. Shattuck*, B. Davis1 (1Wood Mackenzie; 2Novi Labs)  
9:45 Data to Decision: A Unified and Rapid Workflow for Unconventional Reservoirs Blending Data Analytics, Physics-Based Completion Optimization, and Investor-Oriented Economics  
G. Voneiff, P. Bastian (Datagration Solutions Inc.)

Wednesday In Person continued on page 40

*Denotes presenter other than first author | Green icon denotes a team presentation
### Topical Breakfast: The Great Transition?
**Online Only**
7:00 am–8:15 am (See page 18 for summary)
- A. Nelson, Arcadius Capital

### Topical Breakfast: Hess In The Bakken: Lean and Innovation Driving the Next Stage of Development
**Online Only**
7:00 am–8:15 am (See page 18 for summary)
- D. McMichael, Hess

### Special Session: Best of URTeC Latin America I
**Online Only**
**Chair: L. Baez**
(See pages 19 and 20 for summary)
- **8:25** Introductory Remarks
- **8:30** Standardized Workflow For Aquifer Characterization In Neuquén Unconventional Oil And Gas Blocks
  - L. Rodriguez, La Calera, Pluspetrol
- **8:50** Real Time Series Analysis for Early Frac-Hit Detection in Vaca Muerta's Natural Flowing Wells
  - L. Gonzalez Day, Data Science, YPF
- **9:10** Case of Study: Applying Data Analytics to Reveal Most Important Parameters Impacting Well Production Performance in Vaca Muerta Unconventional Formation
  - A.L. Lerza, Chevron Corporation
- **9:30** Machine Learning and Hydraulic Fracture Simulation to Speed up Well Completion Optimization Understanding in Vaca Muerta Formation, Neuquén Basin, Argentina
  - D. Hryb

### Special Session: Best of URTeC Latin America II
**Online Only**
**Chairs: L. Bae**
(See pages 19 and 20 for summary)
- **10:45** Introductory Remarks
- **10:50** Geocellular Model for Vaca Muerta Characterization
- **11:10** High Resolution Geomechanical Model and its Impact on Hydraulic Fracture Height Growth. An Example from Vaca Muerta Formation, Argentina
  - D. Hryb
- **11:30** Pozo D-129 Formation: The Case of a Recent Shale Oil Discovery in a Lacustrine Source Rock in El Huemul Field, Golfo San Jorge Basin, Southern Argentina
  - P. Caprioglio1, G. Jarque1, M. Irigoyen1, N. Luz1, A. D’Agostino1, M. Casal1, D. Villalba2, H. Villar3, 1Sinopec Argentina Exploration and Production, Inc., 2GeoLab Sur S.A.

### Theme 4: Quantifying Natural Fracture Properties and Reservoir Pressure
**Online Only**
**Chairs: A. Munoz, A. Bailey**
- **10:45** Introductory Remarks
- **10:50** Underpressure Distribution and Origin of the Tight Gas Reservoirs in Middle Jurassic J.5b Sh Formation of the Central Siichuan Basin, Southwestern China
  - Q. Wang, D. Chen, X. Gao, Y. Zou (China University of Petroleum(Beijing))
- **11:10** Quantifying Crack Properties of Source Rocks from Elastic Stress Sensitivity
  - J. Ding1, A. C. Clark1, T. Vanorio1, A. D. Jew2, J. R. Bargar2
  - 1Stanford University; 2SLAC National Accelerator Laboratory
- **11:30** Automated Reconstruction of Fracture Networks
  - J. O. Guerrero, B. Chang, D. Hachem, M. Prodanovic, D. N. Espinoza (The University of Texas at Austin)
- **ALT** Applications of Machine Learning for Estimating the Stimulated Reservoir Volume (SRV)
  - A. Rezaei2,1, F. Aminzadeh2,1, E. VonLunen1
  - 1FACT Inc; 2University of Houston

### Topical Luncheon: Promoting Cased Hole Formation Evaluation (CHFE) as an Alternative to Openhole Logging for Completion Design in Horizontal Wells
**Online Only**
12:15 pm–1:30 pm (See page 21 for summary)
- J. Hemingway; SPWLA President

### Special Session: Carbon Capture, Utilization, and Storage I
**Online Only**
**Chair: S. Nash**
- **1:45** Introductory Remarks
- **1:50** CCUS Technical Considerations
  - R. Grover, Schlumberger
- **2:05** Geomechanics for Safe Carbon Sequestration
  - H. Soroush, Petrolern
- **2:20** Methane Detection with Remote Sensing Modalities in Conjunction with CCUS
  - A. O’Conner, L3Harris
- **2:35** Focus on Energy Storage
- **2:50** Derisking Secure CO2 Storage
  - S. Melzer, Melzer Consulting

### Special Session: Carbon Capture, Utilization, and Storage II
**Online Only**
**Chairs: S. Nash**
- **3:50** Introductory Remarks
- **3:55** Developments and the Road Ahead
  - T. Meckel, Bureau of Economic Geology
- **4:10** CCS Projects in North Dakota
  - J. Sorensen, University of North Dakota Energy & Environmental Research Center
- **4:25** On Challenges and Opportunities for CCUS Projects in Kansas
  - E. Holubnyak, Kansas Geological Society
- **4:40** Geoscience and Data in Decarbonised Offshore Integrated Energy Systems Including CCUS
  - M. Stephenson, British Geological Survey
- **4:55** Threading the Needle: Subsurface Evaluation of the Northern Lights CO2 Storage Project
  - R. Meneguolo, Equinor

*ALT = Alternate speaker  
*Denotes presenter other than first author | Green icon denotes a team presentation*
Theme 2: Emerging Petrophysical Evaluations and Completion Quality
Exhibit Hall - Station A
Chairs: L. Louis, S. Rhodes
9:40 Introductory Remarks
9:45 Semi-Automated Lateral Landing Advisor For On Time Decisions Utilizing Digital Borehole Sonic Services and Next Generation Cloud Based Frac Design
E. I. Velez, J. D. Estrada, A. Donald, R. Prioul, T. Lei, E. Wielemaker, V. Lujan (Schlumberger)

10:10 Improved Nanoscale Image-Base Reservoir Characterization Using Supervised Machine Learning
S. L. Eichmann, P. Srinivasan, K. Kenga, M. Khan, F. Duque, F. Oyarzabal, J. Howard, S. Zhang (Aramco Services Company: Aramco Research Center - Houston; 2Saudi Arabian Oil Company; 3DigiM Solution, LLC)

10:35 A Study of Graphite Water Mixtures and Their Direct Current Conductivity as a Function of Frequency and Petrophysical Properties
J. C. Rasmus, D. Homari, G. L. Wang (Retired; Schlumberger)

11:00 Evaluating the STACK and SCOOP Rock and Petroleum System History: Combined Rock Volatiles and Petrophysics Data of Cored Wells Across the Anadarko
M. P. Smith, A. Leavitt, O. Djordjevic, J. Sinclair, R. Brito, C. M. Smith, P. S. Gordon, T. M. Smith, J. Husttedt (Advanced Hydrocarbon Stratigraphy; 2Oivintiv; 3Baker Hughes)

Theme 5: Geomechanical Models and Experimental Rock Mechanics
Exhibit Hall - Station B
Chairs: L. Louis, S. Rhodes
9:40 Introductory Remarks
9:45 Well Intervention Testing Using Fiber Optics Production Analysis
M. A. Grubert (OptaSense Inc.)

Panel Session: Earth’s Surface Imaging for Pivoting: Affordable Drones & Satellite Imaging Geological Exploration and Operations, Environmental Monitoring and Energy Utilization
General Assembly
Moderator: A. Rivera
10:45 am–12:05 pm (See page 18 for summary)
- Introductory Remarks
- V. Natalie, Oklahoma State University
- D. Taranik, Exploration Mapping
- F. Lopez, Kairos Aerospace
- S. Garg, DataVedik
- R. Bell, Drone Geoscience, LLC
- S. Baker, Amazon Web Services

Special Session: DOE Fundamental Shale Research Program II
Room 360 (Speakers presenting via Zoom)
Chairs: I. Aviles
10:45 am – 12:05 pm
Panel 3: Insights on How to Optimize Production: Take-Home Messages
- The Role of Pressure Management in Maximizing Production and Minimizing Environmental Impact; H. Viswanathan
- Understanding Geochemical Signatures in Unconventional Reservoirs; C. Lopano
- The Interplay Between Injection Fluid Chemistry and the Stimulated Rock Volume: Addressing the Roles of Base Fluids, Additives, and Solids
- A. Jew, SLAC National Accelerator Laboratory
- Q&A
- Integrated Q&A and Discussion

Theme 3: New Ideas and Workflows for Reservoir Characterization of Unconventional Reservoirs
Room 351
Chairs: D. Hume, R. Laronga, E. Haddad
10:45 Introductory Remarks
10:50 Quartz Fabric in Shales: Quantification and Assessing its Influence on Geomechanical Properties

11:15 Horizontal Well Evaluation to Determine Geological Facies, Mechanical Properties, and Natural Fracture Changes Using Slim Through-the-Bit Doppler Sonic and Oil-Based Microimaging Tools
E. I. Haddad, E. Velez, F. Al Shaikh, C. Schrader, K. Barrie (Schlumberger; Chief Oil and Gas)

11:40 The Giant, Continuous Three Forks Play, Williston Basin
S. Sonnenberg (Colorado School of Mines)

Theme 7: Data-Driven Production Forecasting and Optimization
Room 361
Chairs: M. Gurfinkel, R. Kou, M. Ashby
10:45 Introductory Remarks
10:50 Autoregressive and Machine Learning Driven Production Forecasting - Midland Basin Case Study
I. Gupta, O. Samandarli, A. Burks, V. Jayaram, D. McMaster, D. Niederhut, T. Cross (Pioneer Natural Resources; 1Novi Labs)

H. Zalavadia, Y. Ben, R. Gordillo, S. Lauver (Occidental)

11:40 Machine Learning Approach to Improve Calculated Bottom-Hole Pressure
E. Eltahan, R. Ganjdanesh, W. Yu, K. Sepehrnoori, R. Williams, J. Nohavitza (The University of Texas at Austin; 2Simtech LLC; 3EP Energy)

Theme 8: Flow and Phase Behavior
Room 370
Chairs: G. Norton, H. Nasrabadi
10:45 Introductory Remarks
10:50 Comparison of Hydrocarbon Gas and CO₂ for Shale Oil Huff-n-Puff EOR
T. Zeng, Y. Guo, K. Mohanty (The University of Texas at Austin)

11:15 The Gas Huff-n-Puff PVT Experiment
M. L. Carlsem, S. Mydland, C. H. Whitson, (Whitson AS; NTNU)

11:40 Discovery Science of Hydraulic Fracturing and Shale Fundamentals
M. Mehana, J. Santos, C. Neil, M. Sweeney, J. Hyman, S. Karra, H. Xu, M. Kang, J. Carey, G. Guthrie, H. Viswanathan (Los Alamos National Lab; University of Texas at Austin; University of Texas)

Panel Session: The New Way to Work: Digital Platforms, Cloud-Based Collaborations, and Ecosystems
General Assembly
Moderator: A. Munoz
1:45 pm–3:30 pm (See page 19 for summary)
- Introductory Remarks
- J. Grant, Chesapeake
- L. Dennett, Wood Mackenzie
- V. Meyer, PetroCubic
- S. Namasiyavam, TGS
- P. Herve, SparkCognition
- J. Fitzgerald, Energy Freelancer/Mineralware

*Denotes presenter other than first author | Green icon denotes a team presentation
Special Session: Best of SPWLA
Room 360
Chair: K. Yared
(See page 20 for summary)
1:45 Introductory Remarks
1:50 Inversion-Based Measurement Interpretation of a New Ultra-Slim Photorealistic Borehole Imager for OBM
Y. Chen
2:15 Adaptation of Crushed Rock Analysis to Intact Rock Analysis for Improving Water Saturation Assessment and Fast Pressure Decay Permeability Quantification
K. Cheng
2:40 Enhanced Assessment of Fluid Saturation in the Wolfcamp Formation of the Permian Basin
S. Dash, Petroleum Engineering, UT Austin
3:05 Measuring Kerogen, Solid Organics, and Oil Production Potentials of Unconventional Source Rocks Using Solid-Type 20MHz NMR Techniques
H. Xie

Theme 3: Regional Geological Evaluations and Studies of Unconventional Plays
Room 371
Chairs: A. Castaldo, M. Poole, M. Belobraydic
1:45 Introductory Remarks
1:50 Examining the Origins and Yield Impact of a Stratified Oil Column in the Montney Formation, Northeast British Columbia
2:15 Evaluating the Liquids Potential and Distribution of West Virginia’s Marcellus Liquids Fairway
2:40 Paleoredox Conditions of Early Carboniferous Upper Bakken Shale, Williston Basin
D. Nandy1, S. Kumar2,1, S. A. Sonnenberg1 (1Colorado School of Mines; 2Shell)
3:05 High Resolution Reservoir Characterization; the Lewis Shale, Greater Green River Basin, Wyoming
L. C. Mayorga-Gonzalez, S. A. Sonnenberg (Colorado School of Mines)

Theme 7: The New Frontier: Combining Physics-Based and Machine-Learning Methods
Room 361
Chairs: B. Dindoruk, M. Gurfinkel, S. Matringe
1:45 Introductory Remarks
1:50 A Physics-Informed Machine Learning Workflow to Forecast Production in a Fractured Marcellus Shale Reservoir
M. R. Gross1, J. Hyman1, D. O'Malley1, S. Karra2, M. Mudunuru2, M. Sweeney1, L. Frash1, B. Carey1, G. Guthrie1, T. Carr1, H. Viswanathan1 (1Los Alamos National Laboratory; 2Pacific Northwest National Laboratory; 3West Virginia University)
2:15 Using the Adaptive Variable Structure Regression Approach in Data Selection and Data Preparation for Improving Machine Learning Based Performance Prediction in Unconventional Plays
C. Ashayeri, M. Korjani, I. Ershaghi (University of Southern California)
2:40 Physics-Assisted Transfer Learning for Production Prediction in Unconventional Reservoirs
J. Cornelio1, S. Murdak2, J. A. Jahandideh1, B. Jafarpour1, Y. Cho1, H.-H. Liu2, R. Vaidya1 (1University of Southern California; 2Aramco Americas)
3:05 Merging Physics and Data-Driven Methods for Field-Wide Bottomhole Pressure Estimation in Unconventional Wells
D. Molinari, S. Sankaran (Xecta Digital Labs)

Theme 10: Workflows to Identify Fracture Geometry/Methods for Subsurface Reservoir Characterization
Room 351
Chairs: D. Hume, C. Neale
1:45 Introductory Remarks
1:50 Defining Hydraulic Fracture Geometry Using Image Logs Recorded in the Lateral of Horizontal Infill Wells
D. P. Craig1, T. Hoang2, H. Li3, J. Magness2, C. Ginn2, V. Auzias2 (1Occidental Oil & Gas; 2Consultant)
2:15 New Insights on Near-Wellbore Fracture Characteristics from High-Resolution Distributed Strain Sensing Measurements
Y. Liu1, G. Jin2, K. Wu1 (1Texas A&M University; 2Colorado School of Mines)
2:40 Analytical Tracer Interpretation Model for Fracture Flow Characterization and Swept Volume Estimation in Unconventional Wells
L. Jain, S. Doorwar, D. Emery (Chevron Corporation)
3:05 New Approach to Reveal Compartmentalization in Montney Horizontal Wells for Completion Design Optimization
J-Y. D. Chatellier1, T. Euzen2 (1Tecto Sedi Integrated Inc; 2IFP Technologies (Canada) Inc.)

Theme 13: Focus on Methane: The Regulatory Challenges and Monitoring for the Future
Room 370
Chairs: A. Fetch, E. Tokarz
1:45 Introductory Remarks
1:50 Unconventional Regulations: How the Development of Unconventional Resources Has Impacted Oil and Gas Regulations in the United States
D. Ryan, J. Benton, E. Halpern (SPE)
2:15 Carbon Neutral Fuel from Light Tight Oil - A Value Proposition
C. A. Ehlig-Economides (University of Houston)
2:40 Strategy Optimization and Technology Evaluation for Oil and Gas Methane Emission Detection
R. Kou, A. Lararus, S. Sridharan, V. Jayaram (Pioneer Natural Resources)
3:05 Monitoring Methane Leaks at Oil and Gas Facilities Using the Same Sensor on Satellite and Airborne Platforms
A. Esparza, J-F. Gauthier (GHGSat)
Theme 4: Tools and Techniques for Measuring Fracture Interactions  
Room 361  
Chairs: A. Bailey, M. Rauch  
3:50 Introductory Remarks  
3:55 Measurement Environment’s Effect on DTS Surveys: A Case Study on Fiber Cable-Wellbore Coupling  
K. Kutun, G. Jin, J. L. Miskimins (Colorado School of Mines)  
4:20 Combining Fracture Depletion Mapping with Image Logs to Better Understand Fracture Driven Interactions  
K. Wutherich, W. Katon, B. Sinosic, J. Glascock (Drill2Frac)  
4:45 Modeling of Distributed Strain Sensing (DSS) and Distributed Acoustic Sensing (DAS) Incorporating Hydraulic and Natural Fractures Interaction  
K. G. Ramos Gurjao, E. Gildin, R. Gibson, M. Everett (Texas A&M University; NanoSeis)  

Theme 8: Modeling  
Room 351  
Chairs: Y. Pei, J. Wang  
3:50 Introductory Remarks  
3:55 A Reduced Physics Modeling Approach to Understand Multiphase Well Production Performance for Unconventional Reservoirs  
D. Molinari, S. Sankaran (Xecta Digital Labs)  
4:20 A Multi-Factor Approach to Optimize Horizontal Shale Wells Flowback and Production Operation  
Y. Liu, R. M. Jones, H. Lu, K. Putri, S. Atmaca, N. J. R. Gonzalez (Shell Exploration and Production Company; Schlumberger)  
4:45 An Experimental Investigation of Oil Recovery in Tight Rocks Using Mixtures of Gases and Nanoparticles  
Z. Quintanilla, W. Ozowe, R. Russell, M. Sharma, R. Watts, F. Fitch, Y. K. Ahmad (The University of Texas at Austin; Messer Americas; Nissan Chemical America Corporation)  

Theme 9: Well Spacing and Well Interference Impact  
Room 360  
Chairs: D. S. Jones, A. Betancourt, Y. Pradhan  
3:50 Introductory Remarks  
3:55 Analysis of Well Interference in Delaware Basin: A Physics-Based and Data-Driven Approach  
E. Eltahen, S. Tavassoli, B. Casey, G. McDaid, E. Goodman (The University of Texas at Austin; Bureau of Economic Geology at the University of Texas at Austin)  
4:20 Evaluation of Parent Well Production Changes Caused by Child Well Frac Hits Using a Pressure Integration Approach  
Y. Guo, P. Ashok, E. van Oort, M. Isbell, E. Butler, A. Riopelle (The University of Texas at Austin; Hess Corporation; Marathon Oil Corporation)  
4:45 Spacing Classification System Delivers Enhanced Confidence in Modeling Unconventional Resource Plays  
S. Valdez, R. Quigley, T. Najvar, A. Beckendorf, A. Taberner, L. Skrobaczyk, G. Olsen, J. Lee (VSO Petroleum Consultants; Texas A&M University)  

Theme 10: Novel Proppants, Low Environmental Impact Fluids and Additives  
Room 370  
Chairs: R. Powell, T. Mallinson  
3:50 Introductory Remarks  
3:55 Proppant Delivered Scale Inhibition – Unconventional Case Histories  
T. Palisch, J. Leasure (CARBO Ceramics)  
4:20 Newest State of the Art Neutrally Buoyant Proppant Facilitates Placement Throughout Created Vertical Fractures to Provide Substantial Production Uplift in Unconventional Wells  
H. D. Brannon, N. Hoffman (Sun Specialty Products)  
4:45 Experimental Investigation of Foam Rheology in Rough Fractures  
A. Radhakrishnan, K. Johnston, M. Prodanovic, D. DiCarlo (The University of Texas at Austin)
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<td>Theme 5: Hydraulic Fracturing: Monitoring, Modeling, and Analysis IV</td>
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<td>Craig, David</td>
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<td>Theme 10: Workflows to Identify Fracture Geometry/Methods for Subsurface Reservoir Characterization</td>
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<td>Crespo, Pablo</td>
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<td>Cross, Ted</td>
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<td>Theme 7: Data-Driven Forecasting and Combining Physics-Based and Machine-Learning Methods</td>
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<td>Crovotto, Carolina</td>
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<td>Theme 11: International and Emerging Challenges of Unconventional Resources: Integrated Geoscience and Engineering</td>
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<td>Theme 13: Focus on Methane: The Regulatory Challenges and Monitoring for the Future</td>
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<td>Theme 3: Reservoir Characterization, Geological Evaluations, and Studies of Unconventional Plays</td>
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<td>Theme 3: Structural Geology as Applied in Unconventioness</td>
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<td>Panel: Implementing New Technologies in the Field: How Companies are Approaching it in 2021 and Beyond</td>
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<td>Gale, Julia</td>
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<td>Theme 4: Reservoir Characterization Using Petrophysics, Geomechanics,</td>
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The society holds their annual meeting every year in different locations across the region. These annual meetings cover topics in conventional hydrocarbon exploration and production, unconventional resources such as shale gas, carbon sequestration, and environmental solutions.

AAPG Mid-Continent Biannual Meeting
Tulsa, Oklahoma | 3–5 Oct. 2021
The Energy Evolution: Learning from the Past Century, Powering the Future: Virtual-Hyatt Regency Downtown, Tulsa, Oklahoma Hosted by: Tulsa Geological Society. For more information please contact Tara Benda - General Chair.

AAPG Geosciences Technology Workshop – Evaporite Processes and Systems
Manama, Bahrain | 4–7 Sept. 2021
For 26 years, the GEO exhibition and conference has been at the forefront of petroleum geoscience. GEO has fast become a next generation energy event, hosting major NOCs, IOCs, manufacturers, and service providers as well as academic and independent researchers involved in early well planning through to delivery to identify key factors that play a role delivering wells in a safe, timely and cost-effective manner.

The Fourth AAPG/EAGE Siliciclastic Reservoirs of the Middle East
Al-Khobar, Saudi Arabia | 6–8 Dec. 2021
The Fourth AAPG/EAGE Siliciclastic Reservoirs of the Middle East Workshop provides a unique opportunity for industry experts and academic researchers to share their findings on any subjects related to the reservoir characteristics and geoModeling of the Middle Eastern siliciclastic reservoirs or other areas across the globe that could serve as analog to the Middle Eastern reservoirs.

AAPG Geosciences Technology Workshop – Source Rocks of the Middle East
Manama, Bahrain | 17–19 Jan. 2022
Save the date for this Geosciences Technology Workshop. More information to follow soon.

AAPG Geosciences Technology Workshop – Exploration in Mature Basins
Muscat, Oman | 7–9 Feb. 2022
Save the date for this Geosciences Technology Workshop. More information to follow soon.

AAPG Geosciences Technology Workshop – Well Planning and Delivery in Unprecedented Times
Geneva, Switzerland | 8–9 Feb. 2022
This workshop will bring together specialists from across the disciplines from IOCs, NOCs and service providers as well as academic and independent researchers involved in early well planning through to delivery to identify key factors that play a role delivering wells in a safe, timely and cost-effective manner.

The International Petroleum Technology Conference (IPTC) 2022
Dhahran, Saudi Arabia | 21–23 Feb. 2022
The International Petroleum Technology Conference (IPTC) will be returning to Saudi Arabia for its fourteenth edition. It is scheduled to be held in Dhahran Expo in Dhahran on 21–23 February 2022. Save the date!

AAPG/EAGE MEDINA Technical Conference and Exhibition
Tunis, Tunisia | 14–16 Mar. 2022
The MEDINA Conference and Exhibition will deliver technical resources, programs, workshops and field trips in support of the Mediterranean and North African oil and gas industry. The conference program will encompass topical panel discussions and technical sessions comprised of research-based presentations with the objective of exchanging knowledge, best practices, and experience among participants as well as networking with colleagues. The event will be regionally focused, and we invite proposals from across the North African and Mediterranean region, as well as globally.
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<th>Presenter</th>
<th>Date</th>
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<tr>
<td>Price, Buddy</td>
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<td>Theme 15: Geoscience Tools and Methods for Understanding the Rock</td>
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<td>Room 370</td>
<td>Theme 15: Unlocking the Production and Recovery Potential of Unconventionals</td>
</tr>
<tr>
<td>Pourpak, Hamid</td>
<td>Tue</td>
<td>11:40 am</td>
<td>Room 370</td>
<td>Theme 1: Optimizing Completions, Perforations, and Stimulation</td>
</tr>
<tr>
<td>Peng, Sheng</td>
<td>Mon</td>
<td>2:30 pm</td>
<td>Room 370</td>
<td>Theme: Flow and Phase Behavior</td>
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<tr>
<td>Pradhan, Yogashri</td>
<td>Mon</td>
<td>11:40 am</td>
<td>Room 370</td>
<td>Theme: High and Low Field NMR Applications</td>
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<tr>
<td>Meyers, Vitaly</td>
<td>Wed</td>
<td>1:45 pm</td>
<td>General Assembly</td>
<td>Panel: The New Way to Work: Digital Platforms, Cloud-Based Collaborations, and Ecosystems</td>
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<tr>
<td>Miners, Dylan</td>
<td>Tue</td>
<td>10:50 am</td>
<td>Room 361</td>
<td>Theme 3: Emerging Geological Evaluations, Tools and Workflows: Data Driven Methods</td>
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<tr>
<td>Mohamed, Farid</td>
<td>Tue</td>
<td>2:50 pm</td>
<td>Online Only</td>
<td>Theme 8: Improving Recovery From Flowback to EOR Potential</td>
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<tr>
<td>Mohd Razak, Syamil</td>
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<td>Theme 7: Data-Driven Forecasting and Combining Physics-Based and Machine-Learning Methods</td>
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<tr>
<td>Mohamed, Farid</td>
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<tr>
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<td>Theme 7: Data-Driven Forecasting and Combining Physics-Based and Machine-Learning Methods</td>
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<tr>
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<td>Room 361</td>
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<td>Panel: Learning from Other Industries: A Geothermal Conversation</td>
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<td>Nandy, Dipanwita</td>
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<td>Theme 3: Regional Geological Evaluations and Studies of Unconventional Plays</td>
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<td>Natalie, Victoria</td>
<td>Wed</td>
<td>10:45 am</td>
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<td>Panel: Earth’s Surface Imaging for Pivoting: Affordable Drones &amp; Satellite Imaging Geological Exploration and Operations, Environmental Monitoring and Energy Utilization</td>
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<tr>
<td>Neal, Scott</td>
<td>Mon</td>
<td>1:45 pm</td>
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<td>Panel: Implementing New Technologies in the Field: How Companies are Approaching it in 2023 and Beyond</td>
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<td>Panel: Data Issues: Management, Integrity, and Legacy</td>
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<td>Nikulin, Alex</td>
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<td>Panel: Sensors, Automation, and Smart Digital Operations: Where We Are and the Road Ahead</td>
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<td>Nizamidin, Nabijan</td>
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<td>Theme 10: Friction Reducers and Other Completion Fluids</td>
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<td>Theme 5: Hydraulic Fracturing: Monitoring, Modeling, and Analysis IV</td>
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<td>Odaichi, Judah</td>
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<td>Theme 5: Hydraulic Fracturing: Monitoring, Modeling, and Analysis IV</td>
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<td>Okuno, Ryoosuke</td>
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<td>Online Only</td>
<td>Theme 4: Measuring Stress, Strain, and Pressure</td>
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<td>Osman, Mutasi</td>
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<td>Online Only</td>
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<td>Panja, Palash</td>
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<td>Theme 2: Drivers for Understanding Reservoir Quality and Completion Quality</td>
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<td>Park, JaeYoung</td>
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<td>Room 362</td>
<td>Theme 9: Future of Production Forecasting and Production Diagnostics</td>
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<td>Theme 5: Diagnostics and Monitoring with Geomechanical Models</td>
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<td>Theme 1: Optimizing Completions, Perforations, and Stimulation Strategies</td>
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<td>Pradhan, Yogashri</td>
<td>Mon</td>
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<td>Room 370</td>
<td>Theme 15: Geoscience Tools and Methods for Understanding the Rock</td>
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<td>Pradhan, Yogashri</td>
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<td>Proctor, Jacob</td>
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<td>Theme 3: Emerging Geological Evaluations, Tools and Workflows: Examples from the Field and Beyond</td>
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<td>Venkateswaran Sriman</td>
<td>Tue</td>
<td>9:45 am</td>
<td>Room 360</td>
<td>Special Session: HFTS/2 Part IV Panel: Supply Chains in Energy: Cost Savings, Quality Assurance, 3-D Printing, and Ethical Sourcing</td>
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<td>Theme 8: Modeling</td>
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<td>Radhakrishnan, Anuradha</td>
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<td>Room 370</td>
<td>Theme 10: Novel Proppants, Low Environmental Impact Fluids and Additives</td>
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<td>Ramos Gajja, Kildare</td>
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<td>Room 361</td>
<td>Theme 4: Tools and Techniques for Measuring Fracture Interactions</td>
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<tr>
<td>Rasmus, John</td>
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<td>Room 361</td>
<td>Theme 2: Emerging Petrophysical Evaluations</td>
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<td>Theme 9: EUR and Performance Prediction - DCA and Beyond II</td>
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<td>Ruiz Maraggi, Leopoldo</td>
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<td>Theme 4: Reservoir Characterization Using Petrophysics, Geomechanics, and Microseismic</td>
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<td>Ruse, Cristina</td>
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<td>Theme 7: Machine-Learning for Subsurface Applications</td>
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<td>Ryan, Deborah</td>
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<td>Ryan, Vanessa</td>
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<td>Theme 4: Novel Seismic Inversion and Attribute Applications</td>
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<td>Savitski, Alexei</td>
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<td>Room 360</td>
<td>Special Session: HFTS/2 Part V</td>
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<tr>
<td>Schmidt, Darren</td>
<td>Mon</td>
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<td>Theme 13: Focus on Methane: Produced Water and Induced Seismicity</td>
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<td>Wed</td>
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<td>Theme 6: Understanding and Predicting Producible Fluids</td>
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<tr>
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<td>Theme 11: Energy Efficiency and Cost Effective Solutions</td>
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<td>Wu, Sheng</td>
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<td>Room 370</td>
<td>Theme 11: International and Emerging Challenges of Unconventional Resources: Integrated Geoscience and Engineering</td>
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<td>Xie, Harry</td>
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<td>Yan, Jerry</td>
<td>Tue</td>
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<td>Theme 15: Novel Recovery Methods to Optimize Costs and Maximize Recovery</td>
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<td>Yan, Yukun</td>
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<td>Theme 5: Hydraulic Fracturing: Monitoring, Modeling, and Analysis II</td>
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<tr>
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<td>Yocham, Kye</td>
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<td>Yu, Wei</td>
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<td>Theme 7: Data-Driven Forecasting and Combining Physics-Based and Machine-Learning Methods</td>
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<td>Zakhour, Nancy</td>
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<td>Theme 1: Optimizing Development Strategies I</td>
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<td>Zalavdia, Hardikumar</td>
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<td>5:00 pm</td>
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AOGR packages all the financial, legislative/regulatory, and of course, technological information readers need to succeed. Each monthly issue delivers timely, accurate and valuable knowledge with real-world applications. Content ranges from success stories about deploying new technology to news from the 28 state and regional independent producer/operator associations AOGR serves as official publication.

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Make time to visit the Exhibit Hall, which provides engaging networking opportunities and events designed to turn initial introductions into long term business relationships as well as providing the latest technologies and product launches in the market.

**EXHIBITION HOURS** *(Located in Exhibit Hall E)*

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<td>• Refreshment Break at 10:00 am and 3:00 pm</td>
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<tr>
<td>• Exhibition Paper Presentations all-day (5055 and 5001)</td>
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<td>• Core Exhibits all-day (#5121)</td>
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<td>• Media Lounge (#4657)</td>
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<tr>
<td>• Opening Reception at 5:00 pm</td>
<td>• Networking Reception at 5:00 pm</td>
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**EXHIBITION HIGHLIGHTS**

In 1971 Devon Energy started its operations with no assets and five employees. Today it is a leading oil and gas producer in the U.S. operating a premier multi-basin portfolio.

Devon’s culture of integrity, focus on forging strong relationships and acting courageously will continue yielding strong results and set the company’s course toward a bright future.

[devonenergy.com](http://devonenergy.com)
### EXHIBITORS (AS OF 15 JULY)

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<tr>
<td>23rd World Petroleum Congress</td>
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<td>APEX Petroleum Engineering</td>
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<tr>
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  Bakken Infill Pilot Analysis and Modeling: Characterizing Unconventional Reservoir Potentials
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