

HGS Bulletin

Volume 60, Number 6

Houston Geological Society

February 2018

HGS SCHOLARSHIP NIGHT

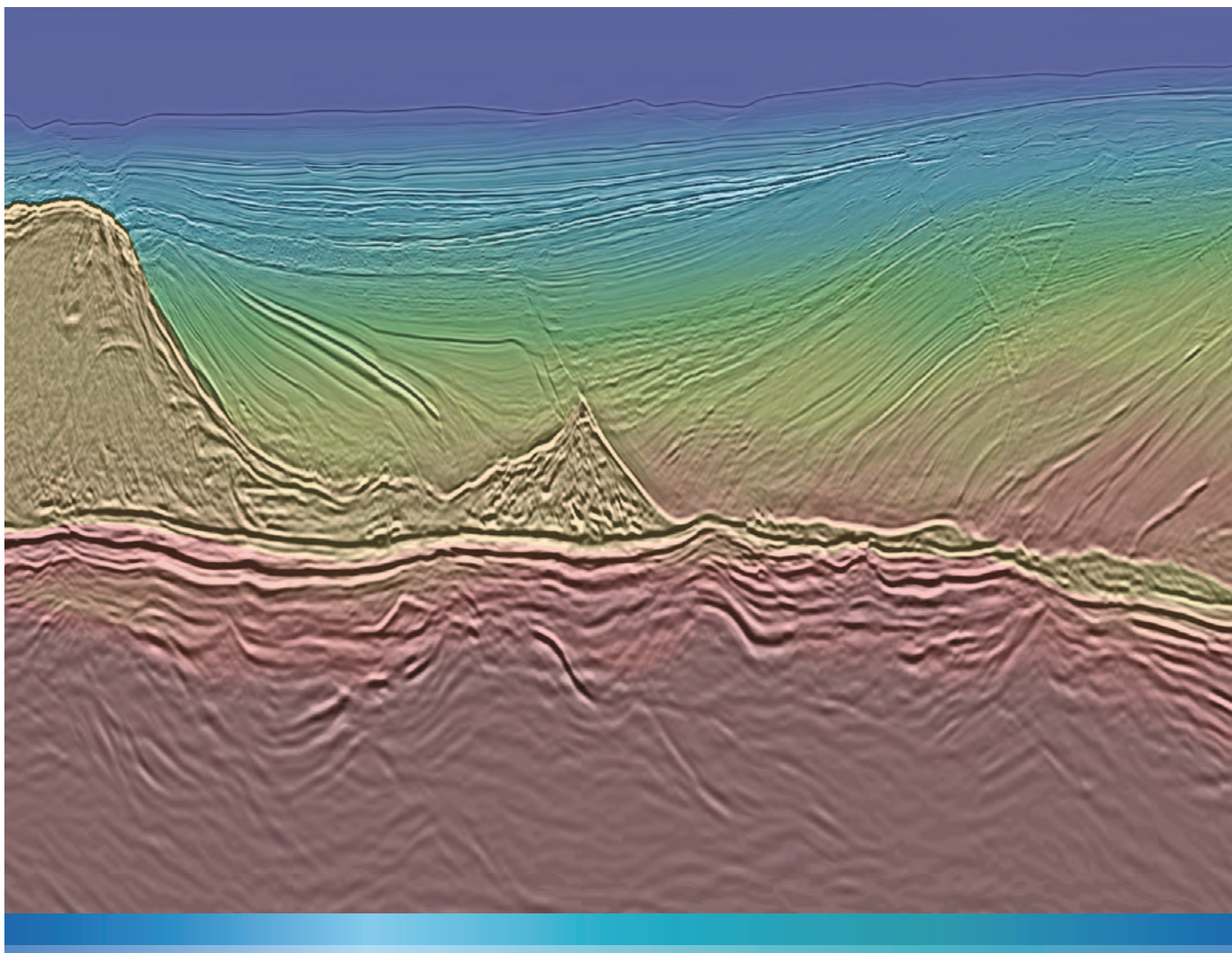
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YOUR NEXT DRY HOLE WILL MOST LIKELY BE CAUSED BY SEAL FAILURE

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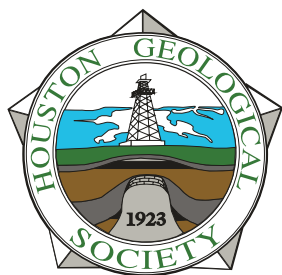
Santos Basin

Brazil – Santos Vision Area 1

PGS announces the availability of Area 1 from its Santos Vision project within the pre-salt play in the Santos Basin, offshore Brazil. The total project will cover 34 000 sq.km. Exploration plays in Area 1 include: a rift/pre-rift fault-trap play in the west-central part of the area, with prospective siliciclastic reservoirs in the Paleozoic pre-rift through Lower Cretaceous rift succession; a sag/rift limestone edge play (Sagitário trend), involving subsalt structural or paleo-topographic traps in microbial platform limestone; and the Carcará North/Uirapuru sag-rift limestone play, which includes the Carcará discovery in BMS-8 and several significant closures at the base of salt.

Santos Vision Area 1 deliverables will be available for the upcoming license rounds.

Please contact: brazilinfo@pgs.com



The Bulletin

Houston Geological Society

Volume 60, Number 6

February 2018

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About the Cover: Pab Sandstone, Pakistan. Photo by Brian W. Horn

Second Announcement and Call for Papers

Big Continent - Big Ideas - Big Opportunity

Strategies for Success

The 17th HGS-PESGB Conference on African E&P

September 11-12, 2018 • Houston Texas

The annual conference, alternating between Houston and London, is the primary technical E & P conference on Africa with attendances exceeding 600, including industry operators, consultants, governments, and academia. The 2018 edition will feature a large poster program and about 25 high quality talks covering aspects of E & P across Africa.

Oral presentations will be systematically arranged in themed sessions:

- African E & P in the evolving business environment – Above Ground Risks & Rewards
- New and emerging exploration trends
- Gas (and oil) in N. and E Africa
- Developing and integrating geological concepts: Impact on exploration in Africa
- Big data, AI and innovative technologies applied to African E & P
- What we thought we knew – Exploration concepts to production reality

Invited Keynote and Other Speakers Include:

Respected industry leaders have accepted invitations to deliver keynote presentations. Confirmations include:

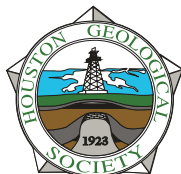
- *Bob Fryklund* (Chief Upstream Strategist-IHS Energy)
- *Tim O'Hanlon*, VP African Business, Tullow
- *Charles Sternbach*, President, AAPG

Further announcements to be revealed in due course; consult HGS and PESGB websites for regular updates.

Special Session: "Exploration in Africa past, present and future - keys to exploration success and disaster avoidance"

New for 2018 – the conference will include a lunchtime, high level round-table panel discussion involving executives and business leaders from key African exploration companies.

Confirmed participants include:



- *Ernie Leyendecker* (EVP Worldwide Exploration, Anadarko)
- *Paul Dailly* (Founding Partner, SVP and Chief Geoscientist, Kosmos)
- *Jayne Baird* (VP Africa and Atlantic Margins Exploration, Woodside)
- *Bob Fryklund* (Chief Upstream Strategist, IHS)

- *Paul Haryott* (Rose and Assoc.)

The panel will discuss recent oil and gas exploration successes and failures and provide strategic, commercial and technical insights in to future opportunities and challenges. (Please note that separate registration for this event will be required).

Short Courses:

In association with the conference one or more short courses will be offered. Check the HGS website for details as they become available.

Call for abstract (oral and posters):

Abstracts (up to 2 pages long and can include diagrams) can be submitted immediately and no later than March 15, 2018 to Africa2018@hgs.org. Extended abstracts are normally written once a paper is accepted for collection on conference digital media to be distributed to registrants. Guidelines for abstract submission are available on the website: <https://www.hgs.org/civicrm/event/info?id=1931>

The best technical contributions will be recognized with prestigious awards from the HGS; as determined by a respected panel of industry judges. The presentation ceremony will take place at the conference close.

Sponsorship opportunities:

Details of sponsorship opportunities and exhibition booths are available at office@hgs.org or on the HGS website. Information on sponsorship opportunities can also be found at <https://www.hgs.org/eventSponsorship>

**Registration will open in April, 2018. Early bird rates will be available:
check the HGS website for details.**

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Applied Geoscience Conference

March 6-8, 2018

Integrated Approaches of Unconventional Reservoir Assessment and Optimization

Please join us for the Houston Geological Society's premier technical conference, offering the latest breakthroughs, technical perspectives and integrated approaches to unconventional reservoir assessment.

DAY 1

- ♦ **Session 1:**
Diagenetic Components of Mudrocks and Their Impact on Production
- ♦ **Session 2:**
Nanoscale Porosity and Hydrocarbon Phase Producibility / Wettability
- ♦ **Session 3:**
Predicting petrophysical flow properties using digital rock physics
- ♦ **Session 4:**
Geophysical Methods for Producibility, Fracability and GeoHazards

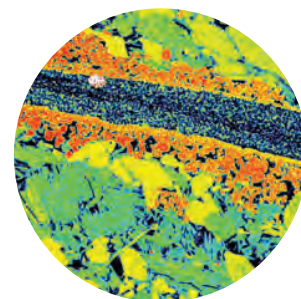
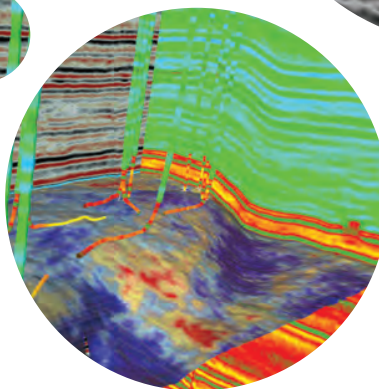
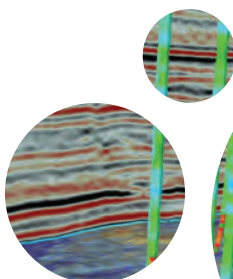
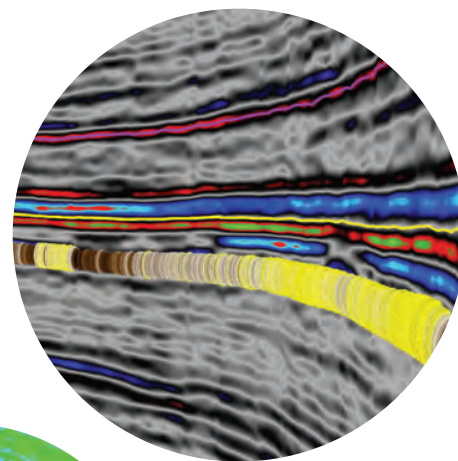
DAY 2

- ♦ **Session 5:**
Analytical Applications for Improved Hydrocarbon Recovery
- ♦ **Session 6:**
Hybrid Tight / Complex Opportunities
- ♦ **Session 7:**
Technology Applications for Stimulated Rock Volumes Versus Drained Rock Volume
- ♦ **Session 8:**
Operator Cases of Integrated Applied Geoscience for Fun and Profit

DAY 3

- ♦ **Workshop (separate registration):**
Applied Methods of Core Descriptions to Maximize Value to an Operator (geared for the novice to the expert)

The full integrated industry member developed program includes the latest University Research (Poster Program Event), supporting Cores (Multi-Core event) and a Luncheon Keynote SME Speaker, as well as an first evening industry social.



ANADARKO CONFERENCE CENTER
1201 Lake Robbins Drive, The Woodlands, TX 77380

Registration Open!

For more information please visit: www.hgs.org



John A. Adamick
john.adamick@tgs.com

Let's Get Social (Media)...

The topic of my column as you may have guessed from the title, is social media. I'm going to try and tell you everything you need to know about social media within the HGS. This is not as easy as it sounds since I am somewhat of a neophyte in this area. But, social media has become an important communication tool for HGS and the world in general.

Communication within our society has changed a great deal over time. Many of the "more mature" members of HGS, myself included, have dealt most of their career with traditional forms of communication. Things like attending meetings and conferences, telephone calls, letters and memos, and other hard copy forms of communication. In the early part of my career few people had desktop computers. The idea of sending email or going to a website did not exist as part of the business. Even after desktop computers started becoming common they were expensive and I distinctly remember sitting in budget meetings where each and every computer request was scrutinized to determine if the individual "really" needed a computer. My how the world has changed since that time!

If we flash forward to today most things, particularly technology, are changing faster and faster. We all use computers and the internet every day visiting websites like the HGS site regularly.

The HGS website has been in existence since the mid-1990's and is a valuable resource for members with loads of current and historical information about the society. With the advent of more powerful computer chips and greater bandwidth our cell phones became smartphones, and the world of information and communication has changed again. Now there are multiple social media outlets in the palm of our hand that are accessible and the HGS is no exception. Listed below are ways that you can interact with HGS in non-traditional ways.

Facebook – The HGS has been involved with social media since 2010 when the first HGS Facebook page was created. As everyone knows Facebook is a social networking site making it easy to connect and share information with your family and friends online. Facebook is the world's largest social network with more than 1 billion users worldwide. The HGS Facebook account is not quite that big (~1525 followers) but is growing with time. There is a lot of good information and commentary and the page is also cross-linked with a page managed by our younger members (NeoGeos). I suggest you give it a try. You can find the HGS Facebook page at www.facebook.com/hgs.org.

LinkedIn – LinkedIn is a social network for professionals who

want to connect with other professionals, grow their careers, and look for new opportunities. The HGS page helps provide this link to geoscientists in the greater Houston area. The HGS LinkedIn page has over 3,450 Group members and 210 followers on the Company page. You can access the account at <https://www.linkedin.com/groups/2455924/profile>.

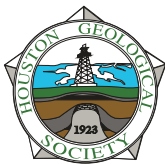
Twitter – Twitter and tweeting are about broadcasting daily short (max 280 characters) burst messages to the world, with the hope that your messages are useful and interesting to someone. This form of microblogging has become very popular with the president of our country and many others. The HGS Twitter page has almost 1,950 followers and provides lots of good commentary and links to geoscience related articles. The site can be found at <https://twitter.com/HouGeoSoc>.

YouTube – YouTube was the first large-scale video sharing site on the Web and another form of social media used to communicate with HGS members. It is available in nearly every country and in over fifty different languages. The HGS began using YouTube to post videos of HGS related events in 2011 and it is a good learning resource. There are over 100 videos currently available on a wide range of subjects. Some of the videos have been viewed literally thousands of times by a very diverse audience. You can check out the videos at <https://www.youtube.com/user/HGSGeoEducation>.

As you can see there are a myriad of ways for HGS members and the community to interact with our organization. I encourage you to utilize these effective resources of communication.

I'd like to close by recognizing HGS volunteer **Dianna Phu**. Dianna was actually the instigator way back in 2010 who convinced the HGS Board that social media was an important way to communicate with members. She has been the Social Media chairman since that time and has progressively added to HGS capabilities. Dianna has also participated as member or chairman of the Communications, Continuing Ed, Website, and NeoGeos committees. She has received numerous HGS awards and was an HGS scholarship winner when she was working on her undergraduate degree at the University of Houston. She has managed to do all of this volunteering while working professionally and raising a family! Dianna is about to go on family leave, but **Lauren Robinson** has agreed to step in and manage the committee in the interim. The HGS would not be successful without volunteers like Dianna and Lauren. Please let them know you appreciate their efforts when you get a chance! ■

The Houston Geological Society Continuing Education Committee Presents



Seismic Attributes and AVO: A Primer

A One-Day Short Course

by Robert Schneider

**Monday, February 19, 2018 • Schlumberger-WesternGeco Auditorium,
10001 Richmond Avenue • Houston, Texas 77042**

This course is a primer on quantitative seismic interpretation. A review of basic seismic concepts will be conducted followed by the meaning and applications of attributes in both the post-stack and pre-stack domains. Proper seismic processing rules are discussed as well as recent advancements and future directions for this technology. This course is designed for geologists, landmen, engineers and students who wish to improve their communication with E&P geophysicists.

Pricing

HGS Members unemployed: call for special pricing

Early Registration: by 8AM, Monday, February 5, 2018:

HGS Member: \$100.00

Non-Member: \$140.00

HGS Student Member: \$80.00

Registration: Through 8 AM, Monday, February 12:

HGS Member: \$110.00

Non-Member: \$150.00

HGS Student Member: \$80.00

Non-members can save \$10 and receive the Member registration price, if they apply for any category of HGS membership online (https://www.hgs.org/membership_overview), submit the application, including payment, then register for the course by calling the HGS Office (713-463-9476) before receiving formal acceptance.

Registrants will receive by email, before the course, a map and specific directions for entrance, parking, and visitor check-in.

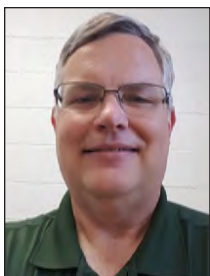
Notebook, Certificate of Attendance, Networking Lunch, Continental Breakfast, Coffee and Break Refreshments are included in the Registration price.

Date: Monday February 19, 2018 • 8:30 am – 5 pm (Doors open at 7:30 am)

Location: Cameron, a Schlumberger company | Helix Building •
3505 W. Sam Houston Pkwy N, Ste 100 • Houston, Texas 77043

Please make your reservations on-line www.hgs.org

For more information about this event, contact HGS Office 713-463-9476 • office@hgs.org



ROBERT SCHNEIDER received his doctorate from the University of Texas at El Paso. He began his career with Amoco Production Company in the Offshore Technology Group working on AVO and attribute applications in the Gulf of Mexico, North Sea, Nile delta and Trinidad and Tobago. Dr. Schneider has also worked for service companies in seismic processing and technical interpretation. In 2016 he became an Assistant Professor of Petroleum Geology at Texas A&M University – Kingsville. He continues work at TAMUK to integrate geophysical and geological information in settings ranging from petroleum to near surface.



Brian W. Horn
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Analogues and Role Models

Last month I wrote about setting goals for 2018 and the role of accountability in accomplishing objectives during the year. I'm sure many of us are in the initial stages of planning goals or perhaps still analyzing the 2017 performance. I wanted to follow-up this month with some thoughts on how to improve technical, commercial, social and personal capabilities.

We are all familiar with the IQ (Intellectual Quotient) Test that evaluates our technical thinking and reasoning capabilities and usually experience smart people always having a high IQ. For the most part this is correct. There is also another measurement called EQ (Emotional Quotient) which is an evaluation of our abilities to engage with others and communicate ideas or emotions on an interpersonal level. I have also found individuals with high EQ are some of the most compelling and engaging people I have met. While they may not necessarily be the smartest person in the room they have the ability to seamlessly weave a story together from a series of disparate ideas or observations. Their ability to communicate and connect with others in a conversation or presentation is always captivating.

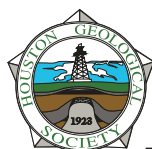
Throughout my formal education at university I learned from professors who taught the 'best courses' with expressions full of passion, intrigue, instruction and analogues. As I began my career in the E&P industry I had mentors that continued to promote conveying ideas using analogues as an effective way to communicate concepts. This can be a powerful method to illustrate ideas by drawing from known or calibrated observations and quantitative evaluations. However, in most instances the analogy is just that and it is only a shadow or reflection of how actual observations may be similar to the analogue. When using analogues it's important to understand the similarities and differences between what we believe to be true (our interpretation of correlation with the analogue) and what is actually true based on actual measurements or calibrated observations. Being able to evaluate the differences and understand why they exist is a critical piece of analysis. While many of the geologic observations can be self-similar and reflect different orders or frequencies of a common theme, we must guard from forcing an interpretation of our observations (round peg) into the model or analogue that suits our purpose (square hole).

Likewise I believe seeking mentors or advisors for career advice or guidance can also be considered as 'analogues' in helping us succeed. I am a firm believer in having a small group of people to meet with on a fairly regular basis that are sounding boards or 'professional analogues' for my professional and personal development. Selecting individuals to support and give us honest and candid feedback as we progress toward our goals should be done seeking individuals with high IQ's and also a high EQ. As geoscientists we would not use a single analogue for a wide range of depositional environments and in seeking counsel we should also select a diverse range of advisors. It is important to seek out mentors throughout a career. It is not a "one and done" type of arrangement, rather it is a continuum of individuals who we seek out as we progress into different roles and encounter people we admire. We can use their careers or abilities as analogues for our careers and professional lives emulating the valuable traits we see in them.

Similar to using analogues in our technical evaluation of projects I also believe it is critical to continually review the people with whom we provide access to our career path conversations. Like analogues we use, some fit in most circumstances and other for just a few special circumstances. In choosing people as advisors it is important to critically evaluate our self-awareness about areas in our professional career that require guidance or training from a more experienced individual.

As I have progressed in my career I have found the most valuable mentors are people that seem to handle tense situations calmly. They have developed the ability to take a deep breath and wonder. The wonder part is key because disagreements or conflict can create professional or personal road blocks. These people are able to pause and change their perspective to *wonder* how the other person sees the discussion and wonder what the other person may feel or believe. Having observed people who are masterful in defusing tense discussions and direct a conversation in a more constructive direction has sparked my desire to be more like them.

As the activities of 2018 go to full swing and we travel the path laid in front of us let's consider the personal analogues we want to use, how we will learn from the valuable characteristics they exhibit and drive us to carry on their spirit of learning and wisdom. ■



Applied Geoscience Conference

March 6-8, 2018

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To sponsor, please contact Andrea Peoples at andrea@hgs.org or 713.463.9476

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Recognition by HGS in Program Book, onsite signage, post show highlights and thank you in HGS Bulletin	✓	✓	✓	✓	✓
Recognition in Conference Announcements and Website (logo with hyperlink)	✓	✓	✓	✓	✓

93%

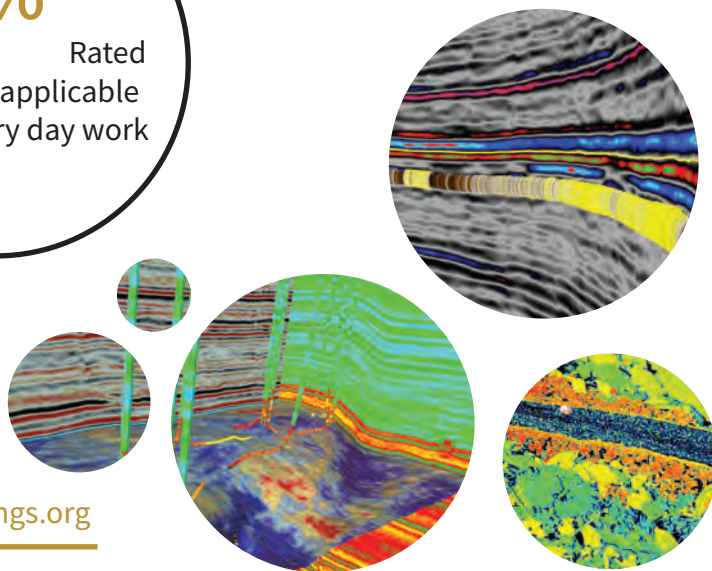
Rated the overall quality of the technical presentations as good or exceptional compared to other industry conferences

91%

Rated the talks as applicable to their every day work

Mail Sponsor Request to:
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For more information and to register please visit: www.hgs.org





Applied Geoscience Conference

March 6-8, 2018

Integrated Approaches of Unconventional Reservoir Assessment and Optimization

To sponsor, please indicate your sponsorship level _____ with payment (payable to HGS) to: HGS, 14811 St. Mary's Lane, Ste. #250, Houston, Texas 77079, Attn: Andrea Peoples. You may also email your completed sponsorship form to andrea@hgs.org.

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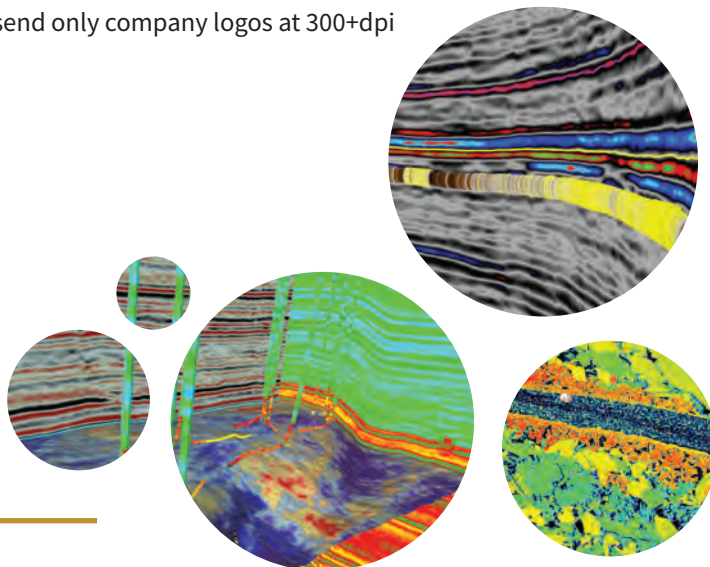
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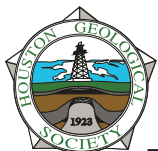
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Applied Geoscience Conference

March 6-8, 2018

Oral Presentations – Tuesday, March 6, 2018

7:00	Registration and Coffee	
8:00 - 8:10	Welcome and Opening Remarks: Frank Walles, <i>Baker Hughes, a GE company</i> ; John Adamick, <i>TGS, HGS President 2017-2018</i>	
	Session 1: Diagenetic Components of Mudrocks and Their Impact on Production Chairs: Tina Calvin, Wayne Camp and Ian McGlynn	
8:10 - 8:45	Quartz Cementation in Mudrocks: How Common Is It	Kitty Milliken, <i>Bureau of Economic Geology, The University of Texas at Austin</i>
8:45 - 9:20	Organic Diagenesis (Artificial Thermal Maturation Studies) – Pyrolysis with SEM Observations	Bobby Hooghan, <i>Weatherford Laboratories</i> ; Lori Hathon, <i>University of Houston</i>
9:20 - 9:55	Fluid Inclusion Technology Applications for Mudrock Petroleum Source Rocks	Don Hall, <i>Fluid Inclusion Technologies, a Schlumberger Company</i>
9:55 - 10:20	Coffee, Posters, Exhibits	
	Session 2: Nanoscale Intra-Kerogen Porosity and Hydrocarbon Phase Producibility/Wettability Chairs: Avrami Grader, James Macquaker and Steve Geeten	
10:20 - 10:55	Reservoir Quality of the Middle Bakken Controlled by a 300 Ma History of Carbonate Cementation and Dolomitization	Andy Aplin, <i>Durham University</i> ; M. Brodie, J.W. Valley, I.J. Orland, B.S. Hart
10:55 - 11:30	Reservoir Characterization and Modeling to Determine the Mechanisms Controlling Enhanced Oil Recovery from Tight Oil Formations – A Bakken Case Study	James Sorensen, <i>EERC</i> ; Steven Hawthorne, Larry Pekot, Beth Kurz, Lu Jin, Jose Torres
11:30 - 12:30	Lunch, Posters, Exhibits	
	Keynote: Chair: Arlin Howles	
12:00 - 12:30	Keynote: Water Resource Issues within Unconventional Resource Development in the Permian Basin	Dr. Bridgett Scanlon <i>The University of Texas</i>
	Session 3: Predicting Petrophysical Flow Properties Using Digital Rock Physics Chairs: Timothy Diggs and Matt Bratovich	
12:30 - 1:10	A Digital Rock Investigation of the Role of Knudsen Number for Flow in Unconventional Reservoirs	Juan Bautista, <i>EXA Corp.</i>
1:10 - 1:45	Multi-Phase Fluid Imbibition, Distribution and Wettability in Shale through Synchrotron Based Dynamic Micro-CT Imaging	Sheng Peng, <i>Bureau of Economic Geology, The University of Texas at Austin</i>
1:45 - 2:20	A Multiscale Study of Fluid Flow in Mudrock Systems	Farzam Javadpour, <i>Bureau of Economic Geology, The University of Texas at Austin</i>
2:20 - 2:45	Coffee, Posters, Exhibits	
	Session 4: Geophysical Methods for Producibility, Fracability and GeoHazards Chairs: Lisa Neelen and Shon Bourgeois	
2:45 - 3:20	Simultaneous Joint Inversion of Converted Wave Seismic Data for Improved Reservoir Characterization (Oklahoma)	Pete Christianson, Magdy Ghattas, Robert Hu, <i>Marathon</i>
3:20 - 3:55	Recognition and Risk Assessment of Dissolution Karst within Permian Evaporites, Delaware Basin, Texas	Alan Morgan, <i>Bell Geospace</i>
	Closing Comments and Invitation to Posters and Core Sessions	
4:15 - 8:00	Social Hour	



Applied Geoscience Conference

March 6-8, 2018

Oral Presentations – Wednesday, March 7, 2018

7:00	Registration and Coffee	
8:00 - 8:10	Welcome and Opening Remarks: Frank Walles, <i>Baker Hughes, a GE company</i>	
	Session 5: Analytics Applications for Improved Hydrocarbon Recovery Chairs: Andrew Silver and Brian Velardo	
8:10 - 8:45	Answering Specific Managerial Completion Questions: More Production for Less Money	Dr. Richard Batsell , <i>Rice University</i>
8:45 - 9:20	The Abuse of R ² : How Correlation Statistics are Misunderstood and Misused	Andrew Silver , <i>Creeta Resources, LLC</i>
9:20 - 9:55	Log Response Groups: Letting the Data Speak For Itself	J. L. Gevirtz and A. P. Ovalle, <i>Halliburton Global Consulting</i>
9:55 - 10:20	Coffee, Posters, Exhibits	
	Session 6: Hybrid/Tight/Complex Opportunities Chairs: Obie Djordjevic and Barbara Hill	
10:20 - 10:55	The Vaca Muerta Play (Neuquen Basin, Argentina). A Case Where Bentonites Help to Assess Early Development Areas, Predict TOC and Quantify Lateral Facies Variations	Daniel Minisini , <i>Shell</i>
10:55 - 11:30	Depositional Interpretation and Sequence Stratigraphic Control on Reservoir Quality and Distribution in the Meramec STACK Play: Anadarko Basin, Oklahoma	Buddy Price , A. Pollack, A. Lamb, <i>Devon Energy</i>
11:30 - 12:30	Lunch, Posters, Exhibits	
	Session 7: Technology Applications for Stimulated Rock Volume Versus Drained Rock Volume Chairs: Luis Baez and Eric Michaels	
1:00 - 1:35	Accelerating Completions Concept Select in Unconventional Plays Using Diagnostics and Frac Modelling	Jim Brewer , <i>Shell</i>
1:35 - 2:10	Optimizing Field Development Strategy Using Time-Lapse Geochemistry and Production Allocation in Eagle Ford	Jason Jweda , <i>ConocoPhillips</i>
2:10 - 2:45	Sampling a Stimulated Rock Volume	Kevin Raterman , <i>ConocoPhillips</i>
2:45 - 3:15	Coffee, Posters, Exhibits	
	Session 8: Operator Cases of Integrated Applied Geoscience for Fun and Profit Chairs: John Breyer and Raj Malpani	
3:15 - 4:15	Permian Basin Wolfcamp: Field Development, Critical Data Acquisition, Integration & Workflow	Phil Lindner , John Ndungu , <i>Pioneer</i> ; Kyle Scott, Omkar Jaripatke, Hector Bello, Weichun Chu, <i>Pioneer Resources</i>
	Closing Comments and Invitation to Posters	

Poster Session

Invited Presentations from Graduate Students
Open during Coffee and Lunch Breaks



Applied Geoscience Conference

March 6-8, 2018

Posters – March 6-8, 2018

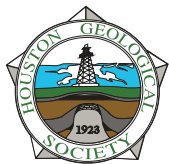
Poster Session Chair: Mike Effler

University	Student Name	Poster Topic
Oklahoma State University	Michele Abshire	The Uranium/TOC Conundrum of Black Shales: What Gamma-Ray Logs Might Miss
Oklahoma State University	Yulun Wang	Natural Fractures and Their Relationship to Facies, Sequence Stratigraphy, and Rebound Hardness, the “Mississippian Limestone” Play, North-Central Oklahoma, U.S.A
Texas A&M University	Telemachos Manos	Thermal Maturity Modeling of Organic-Rich Mudrocks in the Delaware Basin using Raman Spectroscopy of Carbonaceous Material
Texas A&M University	Roy Conte	Integrating Core, Wireline Log and Chemostratigraphic Data with Biostratigraphic Data and High Resolution U-Pb Zircon Geochronology to Determine Timing Constraints on the Eagle Ford Group Depositional Processes and Stratigraphy
Texas A&M University	Sergey Parsegov	Micromechanics of Mudstones. Cost Effective Measurements
The University of Oklahoma	Pritesh Bhoumick	Mapping Hydraulic Fractures Propagation using Polarized Shear Wave
The University of Texas of the Permian Basin	Fatimah Adelekan	Integrated study of the Wolfcamp Debris Flow, Delaware Basin, Texas to Determine the Depositional Environment, Sequence Stratigraphy and Petrophysical Analysis: Case Study – Mendel Field
The University of Texas of the Permian Basin	Joanna Walker	A New Approach to Fracture Identification within the Wolfcamp Formation of the Delaware Basin By Means of Dispersion from Refracted Shear
University of Alberta	Noga Vaisblat	Rock Fabric, Rock Composition, and Reservoir Quality in the Montney Formation, Western Canada
University of Calgary	Emma Percy	Calcareous Organic-Rich Mudstone Depositional Processes on a Low-Gradient Ramp, Example from the Turonian Second White Specks Formation, West-Central Alberta, Canada
University of Houston	Zohreh Souri	Identification of Sweet Spots for Hydraulic Fracture in Avalon Shale, Permian Basin, Using Lithofacies Classification
University of Kansas	Jeff Jennings	Identifying at Risk Areas for Injection-Induced Seismicity Through Subsurface Analysis of the State of Kansas

Participating Schools

Oklahoma State University • Texas A&M University • The University of Oklahoma
 The University of Texas of the Permian Basin • University of Alberta • University of Calgary
 University of Houston • University of Kansas

Open During Coffee and Lunch Breaks



Applied Methods of Mudstone Core Description and Interpretation

A One-Day Short Course

by Dr. Ursula Hammes and Dr. Kirk Campion

**Thursday, March 8, 2018 • Bureau of Economic Geology Houston Research Center
11611 West Little York, Houston, TX 77041**

The Houston Geological Society is pleased to announce a new continuing education seminar titled “Applied Methods of Mudstone Core Description and Interpretation” held in conjunction with the Applied Geoscience “Mudrocks” Conference on March 8, 2018 at the Bureau of Economic Geology Houston Research Center (HRC) core facility, in Houston, Texas.

The one-day seminar is intended for geologists of all experience levels interested in improving their skills in identifying and interpreting physical sedimentary structures, and recognizing vertical stratigraphic relationships observable from conventional full-diameter slabbed cores. Participants will learn how to identify key sedimentary features in a stratigraphic context necessary to describe mudstone facies at a practical scale to tie to well logs for improved reservoir characterization and mapping.

The full-day course will consist of introductory lectures followed by hands-on core examination guided by the instructors Dr. Ursula Hammes and Dr. Kirk Campion. A wide variety of productive shale and tight oil and gas reservoirs will be examined from the following formations: Bakken, Woodford, Mississippian Lime, Haynesville, Eagle Ford and Marcellus.

Class size is limited, so register early



Date: Thursday, March 8, 2018

Please make your reservations on-line www.hgs.org

For more information about this event, contact HGS Office 713-463-9476 • office@hgs.org



DR. URSULA HAMMES is president and founder of Hammes Energy & Consultants, LLC located in Austin, Texas. Her current research interest is focused on shale oil & gas systems from basin- to nano-scale applying her background in carbonate and clastic sequence stratigraphy, depositional systems analysis, and reservoir diagenesis. Dr. Hammes received her Master's degree from University of Erlangen, Germany and her PhD from the University of Colorado at Boulder. Ursula has held past positions at Anadarko Petroleum, The Woodlands; the Texas Bureau of Economic Geology, Austin; and the University of Potsdam, Germany. Dr. Hammes serves as an associate editor for the *AAPG Bulletin*, AAPG Energy Minerals Division Shale Gas and Liquids Committee Chair, and has served as president of the Gulf Coast Section SEPM. She has published over 200 papers, including co-editing

AAPG Memoir 105 on the Haynesville shale gas field. Dr. Hammes is currently an adjunct professor teaching at Texas A&M University as a Halbouty Visiting Chair.



DR. KIRK CAMPION is currently a consulting geologist, recently retired from Marathon Oil Company where he worked as a senior stratigrapher from 2008 to 2017. Prior to working at Marathon, he worked at Exxon Production Research Company and ExxonMobil Upstream Research Company for 29 years as a clastic sedimentologist and stratigrapher, specializing in deep-water sequence stratigraphy. Dr. Campion received his Master's Degree from the University of Nebraska and his PhD from Ohio State University. Kirt has worked with core data representing wide variety of unconventional petroleum systems including: the Bakken in the Williston Basin, Woodford in the Anadarko Basin, Eagleford in south Texas, Siluro-Ordovician in Poland, and Spraberry in the Permian Basin. Kirt has been an active member of AAPG and SEPM for over 40 years. He has published several papers on sequence

stratigraphy and on deep-water stratigraphy in California and Chile. He has guided field trips to a number of localities in California and Utah for AAPG, SEPM and GSA.

HGS Presents:

Take a kid to the outcrop family campout!

**April 27 - 29, 2018
Camp Cullen YMCA in Trinity, TX**

Come join fellow HGS members and their families for a weekend of fun! Activities include:

**Interpreted quarry with hunts for fossils and petrified wood
Newly renovated geology lab with samples and flume**

Gold panning

Zip line

Archery

Riflery

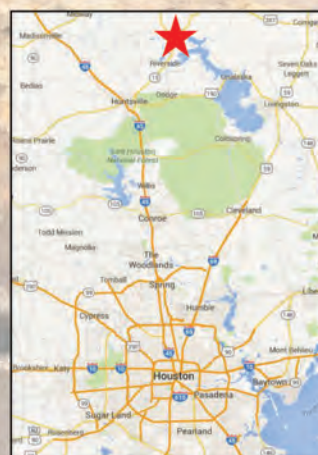
Arts & crafts

Marathon pipeline slide

Basketball

Gaga ball

Campfires



All of this and more, all only 1.5 hours north of Houston!

Check in Friday evening and check out Sunday morning. Cost is \$110/person for up to 4 people. For families of 5+, call for a discounted rate. The fee includes overnight stay Friday and Saturday nights, 4 meals and all activities. Each family will have a private bunkhouse for up to 8 and private family bathroom in newly renovated cabins. For more information on the facilities, please visit the Camp Cullen website at <https://www.ymcacampcullen.org/>

**Reserve your spot today! Reservations accepted through
April 19th, 2018
Call the HGS office at 713-463-9476**

Monday, February 12, 2018

New Location

Live Oak Room • Norris Conference Center • 816 Town and Country Blvd #210

Social Hour 5:30–6:30 p.m.

Dinner 6:30–7:30 p.m.

Cost: \$40 Preregistered members; \$45 non-members/walk-ups

To guarantee a seat, pre-register on the HGS website & pre-pay by credit card.

Pre-registration without payment will not be accepted.

Walk-ups may pay at the door if extra seats are available.

If you are an Active or Associate Member who is unemployed and would like to attend this meeting, please call the HGS office for a discounted registration cost. We are also seeking members to volunteer at the registration desk for this and other events.

HGS Scholarship Night Dinner Meeting

Charles A. Sternbach

AAPG President

HGS Scholarship Night Dinner Meeting

Scholarship Night

Please join us on this evening to recognize HGS Scholarship Winners over the current fiscal year.

Lessons in Exploration Creativity from a Decade of Discovery Thinking Forums and AAPG's Global Super Basin Leadership Initiatives

AAPG/DPA Discovery Thinking Forums began in 2007. This was an initiative of the 100th Anniversary committee featuring discoverers telling stories about new field or new play discoveries at invited Forums at AAPG Annual Meetings. These immediately became a popular and integral part of the AAPG Technical Programs. These were started at the ACE Meetings, but global interest led to these forums becoming part of the ICE Technical program in 2012.

Since inception there have been 19 Discovery Thinking Forums at both ACE and ICE events. More than 100 speakers and their co-authors have presented discoveries they know well, commonly to standing room only audiences. We owe these “100 who made a difference” heartfelt gratitude as we celebrate the AAPG Centenary. They have generously gifted us with hard won and costly insights leading to significant discoveries. They offer analogs for technical and business success. What is the greatest lesson to us? Michel T. Halbouty said of pioneering wildcatters: “If they could do it, why can't we?” We pay tribute to the 115 men and women who have participated in these forums. We will feature several brief representative vignettes of previous presentations spotlighting valuable exploration lessons.

Resources hosted on the AAPG Search and Discovery website (Special Collections, Discovery Thinking) form an enduring heritage to modern and future explorers. Multimedia

presentations of previous Discovery Thinking talks have been viewed tens of thousands of times. In addition, AAPG/DPA has launched Playmaker Forums, 1 day stand-alone events on Discoveries. Playmakers also offer a collection of multimedia presentations. Thanks to all the presenters. We celebrate their success and thank them for leaving their heritage better than they found it. May they inspire us to new make new discoveries!

*AAPG is dedicated to
providing valuable
geoscience and
professional content
to fuel prosperity in
AAPG's second century.*

AAPG is dedicated to providing valuable geoscience and professional content to fuel prosperity in AAPG's second century. Since 2010 a technology led energy renaissance of activity in the world's most richly endowed “super basins”. The Permian and Gulf Coast basins are prototype super basins with more than 5 BBOE produced, 5BBOE future reserves, multiple source rocks, many pays, infrastructure, and well established service sectors. The top 25 super basins around the

globe have potential energy resources of more than 800 BBOE (Bob Fryklund, Pete Stark, and IHS Markit). Above ground choices by host countries will play a key role in future energy prosperity. To share best practices on energy, economics, and environment, AAPG plans a 2-day Global Super Basin Leadership Conference March 27-29, 2018 at the Hilton America Hotel, Houston Texas. ■

<http://www.searchanddiscovery.com/specialcollections/discoverythinking.html> HGS Scholarship Night Dinner continued on pag 17

HGS Shrimp Peel & Crawfish Boil

Friday April 20, 2018
12:00 noon - 6:00pm

Bear Creek Pioneers Park

3535 War Memorial Street, Houston, TX
77084



Boiled Shrimp - Boiled Crawfish
(Corn & Potatoes)

Beer & Beverage - Live Music

HGS member pre-order \$30

Non-member pre-order \$35

Walk ups (if available) \$45

Register online at WWW.HGS.org

<https://www.hgs.org/civicrm/event/info?id=1783>

Sponsorship Opportunities

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Crawfish Sponsor \$2000.00 - 4 Complimentary event tickets

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or email andrea@hgs.org*

Biographical Sketch

CHARLES A. STERNBACH has explored for and discovered Energy in the US and around the globe for 35 years. He was Staff Geologist for Shell Oil Company, Exploration Manager for Tom Jordan (Jordan Oil and Gas), President of First Place Energy (International frontier exploration) and is currently President of Star Creek Energy. Charles has a PhD (and MS) in Geology from Rensselaer Polytechnic Institute and a BA in geology from Columbia University.



Recently Charles has focused his efforts on Exploration Creativity, studying how explorers and their teams have found giant fields. He created and leads the popular AAPG Discovery Thinking Forums which have been standing room only events at annual AAPG conventions in North America (ACE) and around the world (ICE). These impactful programs integrate geology, geophysics, and engineering into case studies of business success.

Charles is a proud member of the American Association of Petroleum Geologists (AAPG) and he currently serves as President of this 30,000 member organization. He is a co-editor with Dr. Robert Merrill on the fifth installment of the AAPG memoir series Giant Fields of the Decade 2000-2010 Memoir 113). In April 2017 he served as lead editor of the AAPG/DPA Book: Heritage of the Petroleum Geologist. This book celebrated 101 great men and women geoscientists for AAPG's 100th Anniversary. In his 35 years of service to AAPG Charles has also served as past president Gulf Coast Association of Geological Societies, past president Houston Geological Society, and past president of AAPG's Division of Professional Affairs. He has been recognized with Honorary Membership by each of these organizations.

Charles currently resides in Houston, Texas with his wife Linda who is a distinguished geophysical advisor (and past president of HGS).

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February 2018

Houston Geological Society Bulletin

17



Upstream Oil & Gas Professionals Hiring Event

March 27, 2018 • 10am to 3pm

Trini Mendenhall Community Center • 1414 Wirt Rd., Houston, TX 77055

<http://www.pct3.com/community-centers/mendenhall-community-center/>

The Members-in-Transition committee invites you to participate in the third edition of the Upstream Oil and Gas Professionals Hiring Event. Following the success of the March 2017 inaugural event we continue to provide a platform for connecting experienced job seekers with oil and gas companies with open positions.

Job Seekers: Around 40 companies are expected at the Hiring Event! Meet with employers hiring for professional upstream positions. Stay tuned for registration details and upcoming guidance sessions to help you maximize your success at the Hiring Event.

Employers: A booth at the Hiring Event presents an ideal opportunity to fill your job vacancies while providing valuable exposure for your company. Hundreds of high-quality experienced individuals in the upstream oil and gas industry are expected to attend.

Sponsors: Sponsorship for the Hiring Event will help build your name, image, and pride by supporting an event that helps fuel and sustain the oil & gas industry in the Gulf Coast section.

Collaborating Organizations: Professional organizations with a common interest to support their members during career transitions can provide value to their members by participating in the Hiring Event.

Event Contact Info: Bob Merrill and Ramesh Anand, Co-chairs. spegcs.mit.hiringevent@gmail.com
713-409-7340/281-403-6070

PRICING

Employer: Pricing is based on number of employees. Less than 50 = \$100; between 51 and 1000 = \$500; more than 1000 = \$1000

Sponsors: Options include Bronze = \$200; Silver = \$300; Gold = \$500; Platinum = \$1000; Diamond = \$2000 (need not be an employer to sponsor)

Job Seeker: registration fee of \$5 opens February 23, 2018

SPE Registration Link:

Employer: <https://www.spegcs.org/events/3829/>

Job Seeker: Job Seeker registration opens February 23, 2018

Wednesday, February 21, 2018

Black Lab Pub, Churchill Room • 4100 Montrose Blvd.
Social Hour 5:30–6:30 p.m.
Dinner 6:30–7:30 p.m.

Cost: \$30 Preregistered members; \$35 non-members/walk-ups

To guarantee a seat, pre-register on the HGS website & pre-pay by credit card.

Pre-registration without payment will not be accepted.

Walk-ups may pay at the door if extra seats are available.

If you are an Active or Associate Member who is unemployed and would like to attend this meeting, please call the HGS office for a discounted registration cost. We are also seeking members to volunteer at the registration desk for this and other events.

HGS Environmental & Engineering Dinner Meeting

David Bardsley, P.G.

Vice President, Directed Technologies Drilling

James Beach, P.G.

Senior Vice President, LBG-Guyton Associates

ETHICS MOMENT

We will dedicate 15 minutes at the beginning of each meeting to ethics to apply towards 0.25 hours of ethics credit.

Horizontal Directional Drilling for Water Supply Applications

Horizontal directional drilling (HDD) methods have been utilized for environmental and engineering applications starting in the late 1980's. Since then HDD wells have been installed for a wide variety of environmental and geotechnical applications. One industry that has not significantly applied HDD drilling and well installation methodology is the water supply industry. Over the last twenty years only a handful of high capacity water wells have been installed using HDD, compared with hundreds of environmental and geotechnical wells. Most of these water supply installations have been in relatively shallow aquifers with direct connections to surface water bodies. It has long been recognized that horizontal wells allow significantly more screen to be placed into the production zone of a thin aquifer than vertical wells. Decades of experience are now being applied to develop water supply wells for industrial use. Our talk will describe the aquifer characterization using geophysics, site selection in a relatively thin aquifer, and groundwater modeling completed prior to construction. We will also provide details of the well completion process, including drilling and locating assemblies, well materials, reaming processes, well installation and development operations. ■

Biographical Sketches

DAVID BARDSLEY has over thirty-three years of environmental drilling experience working in a variety of settings across the United States. He started his career as a drill rig helper and advanced through various technical and managerial positions in small and large drilling companies. He was an early leader in the use of horizontal



drilling to solve environmental and water supply challenges and has authored/co-authored over 20 papers on horizontal environmental drilling methodology. David has been directly involved in the design and installation oversight of over 100,000' of horizontal environmental and water supply wells.

Mr. Bardsley has a Bachelor of Science degree in Geology & Geophysics along with a Communications Minor (1984) from the University of Missouri-Rolla. He is a licensed well driller in Texas, Arizona and Louisiana and holds RG/PG certifications in Texas, Missouri, Louisiana and Tennessee. He is a strong proponent of education and has served as a short course instructor at Battelle environmental conferences and University of Wisconsin Madison along with presenting environmental drilling training to students at University of Arizona and University of Louisiana Lafayette.

JAMES BEACH is a Senior Vice President with LBG-Guyton Associates in Austin, TX. He is a Professional Geoscientist with over 25 years of experience in quantitative groundwater and surface-water hydrology, water resource planning, water supply development, environmental assessments, numerical flow and solute transport modeling,

quantitative contamination evaluations, and litigation support. Mr. Beach has consulted for municipalities, water supply corporations, industrial concerns, private landowners, and government entities and has been involved several large groundwater permitting and transfer projects.



Nomination for HGS Teacher of the Year Award

The HGS Teacher of the Year Award has been established to honor individuals whose extraordinary efforts or unique contributions are in earth science education. The selected Teacher is given a \$500 cash award along with a plaque presented at a HGS Event. The HGS Teacher of the Year will be encouraged to apply to the GCAGS and AAPG Teacher of the Year Programs which offer greater cash bonuses (\$1500 and \$5000 respectfully). Send requests or questions for requirements and procedures for award

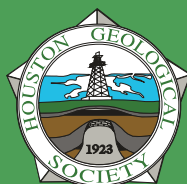
applications to Mike Deming HGS Awards Chairman at mike.deming.HGS@gmail.com.

All application materials must be mailed by April 1, 2018 to the HGS Office at: Houston Geological Society, Attn: Awards Chairman, 14811 St. Mary's Lane, Suite 250, Houston, Texas 77079-2916. ■

Announcing Houston Geological Society's *Prospect Corner*

Advertise Your Prospects

Post your prospect teaser on the HGS website for \$250/month



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Your Next Dry Hole Will Most Likely Be Caused By Seal Failure

Owing to advances in seismic technology two of the major components in conventional prospects, trap geometry and reservoir presence, can be so fully evaluated that these components often carry minimal exploration risk. As a consequence the primary cause for dry holes and sub-economic discoveries has now shifted to being the result of seal failure. A survey done by Schlumberger proposes that 45% of industry dry holes are owing to lack of seal. A recent paper by Rudolph and Goulding (2017) supports idea. A post mortem study of exploration drilling by Exxon over a ten year period found that 50% of the dry holes resulted from trap failure and this percentage increased to 60% in mature or well understood plays. Despite these findings there is a lack of understanding regarding importance of seals in hydrocarbon trapping and the sophistication of seal evaluation. In most work flows seal evaluation is commonly done with little technical rigor during the time squeeze at the end of a prospect evaluation and the seal evaluation is often so superficial as to be nearly meaningless.

Part of the reason for a lack of rigor is complacency, a misplaced attitude of – *I have a thick shale so how can there be seal risk?* But beyond this there are systemic factors that confuse, misdirect and frustrate non-specialist's efforts. First, there is no consensus among practitioners about sealing mechanisms and how to evaluate them – i.e. there is no accepted seal evaluation workflow. During the 2012 EAGE conference on seals a poll was conducted and on nearly every question sizable minorities disagreed with the majority views. For example, on the question whether fault gouge acts as a static seal, 59% of respondents said it often did and 27% said it did not. Second, larger companies have conducted research in this area, but data and conclusions are proprietary and key concepts are under documented in published literature. Those doing evaluations are forced to extrapolate globally from a very limited number of local studies. It is common to have a major concept based on a single published study. A cynic, with justification, may see the foundations of seal evaluation as so weak that the whole effort is invalid.

To do better and realistic seal evaluations leading to fewer dry holes, requires three things:

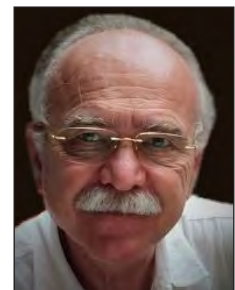
1. A good technical understanding of seal failure mechanisms including misconceptions and evaluation pitfalls. As cases in

point knowing when gas chimneys are positive risk features or why blown traps in the North Sea are still often drilled as discoveries.

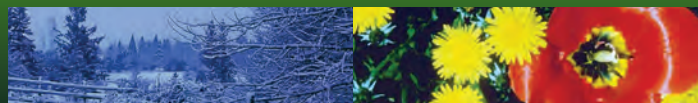
2. A Play Based Exploration approach that fundamentally asks "What do you know and where do you know it?" Doing play focused lookbacks that establish baseline statistics on seal failure and comparison of your prospect's seal to both known successes and failures in terms of facies, seismic character, physical properties, etc. As an example, typical deepwater shales in Brazil retain less than half the hydrocarbon column of typical deepwater shale seals in the Gulf of Mexico.
3. A coherent risking philosophy that weighs both confidence in the seal model and the technical conclusions from that model. A philosophy that takes the degree of uncertainty in the seal model as part of the risking input. Quotes from statistician George Box are relevant to this, *All models are wrong but some are useful* and *How wrong do they have to be to not be useful.* ■

Biographical Sketch

John Karlo worked for 30 years with Shell followed by 5 years with Maersk Oil and 2 years with Repsol. He has held positions in play development and prospect evaluation, regional evaluation teams, deep water exploration, mergers and acquisitions. John worked was a senior advisor in Quality Assurance overseeing rigor in structural interpretation for ten years. He has worked in rifts, passive margins, fold belts and turbidites in multiple basins worldwide. Some of the high points in his career include the first regional synthesis of the Dutch North Sea tectonics, groundbreaking work on Gulf of Mexico salt tectonics and deepwater exploration leading to world class discoveries in Nigeria. His current focus is on the complex subject of seal evaluation and the seismic expression of structural styles, subjects where he feels he can contribute to the education of the upcoming generation of geoscientists. Prior to his industry career he taught structure and geophysics at Central Michigan University John received his BA from Rutgers University, MA from Univ. Missouri and a PhD in structure and tectonics from S.U.N.Y..



February 2018



S u n d a y

M o n d a y

T u e s d a y

W e d n e s d a y

4	5 NAPE Summit Week <i>George R. Brown Convention Center Houston, TX</i>	6 HGS Board Meeting <i>6 p.m.</i>	7
11	12 HGS Scholarship Night Dinner Meeting <i>"Lessons in Exploration Creativity from a Decade of Discovery Thinking Forums and AAPG's Global Super Basin Leadership Initiatives," Charles A. Sternbach Page 15</i>	13	14
18	19	20	21 HGS Environmental & Engineering Dinner Meeting <i>"Horizontal Directional Drilling for Water Supply Applications" David Bardsley and James Beach Page 19</i>
25	26	27	28 HGS General Luncheon Meeting <i>"Your Next Dry Hole Will Most Likely Be Caused By Seal Failure," John Karlo Page 21</i>

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GEOEVENTS

Thursday

Friday

Saturday



1 Don't wait, make your reservations online at hgs.org	2	3
8	9	10
15	16	17
22	23	24

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Members Pre-registered Prices:

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March 6-8, 2018

HGS Applied Geoscience
Conference
*Integrated Approaches of
Unconventional Reservoir
Assessment and Optimization
The Woodlands, TX (Page 4)*

April 20, 2018

HGS Shrimp Peel and Crawfish
Boil
*Bear Creek Pioneers Park
Houston, TX (Page 16)*

April 27-29, 2018

Take a kid to the outcrop family
campout
*Camp Cullen YMCA
Trinity, TX (Page 14)*

September 11-12, 2018

The 17th HGS-PESGB Conference
on African E&P
Houston, TX (Page 2)

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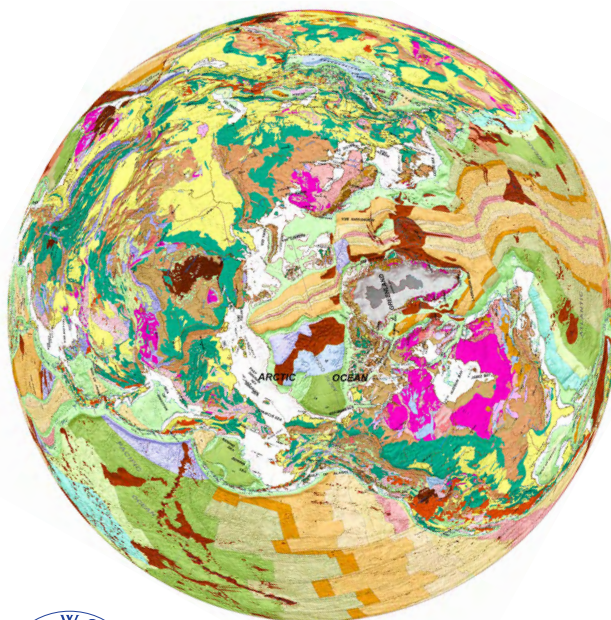
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Microbial Carbonates in Central Texas Field Trip



Microbes are defined as microorganisms visible only under a microscope. Some examples are bacteria, fungi, molds, algae, and protozoa. Microbial sediments have always attracted the attention of sedimentologists and paleontologists, but in recent years the discovery of large oilfields in microbial carbonate reservoirs has generated renewed interest in these rocks, especially in the environments in which microbial carbonates form and the characteristics that make them good reservoirs. What used to be classified as “algal” is now classified as microbial or calcimicrobial. The older classification of living things that included kingdoms of animals and plants has been supplanted by a scheme that puts all living things into three main branches called “domains” of life – Bacteria, Archaea, and Eukarya. Bacteria, including cyanobacteria, and Eukarya, red and green algae and fungi, are the principal “actors” involved in the formation and diagenesis of microbial carbonates.

Most microbial sediments and rocks are carbonates. Some of the most spectacular examples are found in Upper Cambrian carbonates of Central Texas – microbial buildups and associated facies in the Point Peak and San Saba members of the Wilberns Formation. Point Peak and San Saba outcrops in Central Texas expose some of the best preserved Cambrian microbial carbonates anywhere. These microbial limestones have not been tectonized and their depositional fabrics and textures have been remarkably well preserved with only minor dolomitization in some stromatolitic and oolitic facies. Thin section study of the microbialites reveals four different calcimicrobes; *Girvanella*, *Epiphyton*, *Renalcis*, and *Nuia*.

Point Peak and San Saba rocks outcrop around much of the Llano Uplift (a structural dome with its cover removed to form a topographic basin). The best exposures are in the western part of the area in Gillespie and McCulloch Counties, extending from

the Doss settlement in the southwest to the San Saba River in the north. Because it is not always easy to get access to outcrops on private land in the Texas Hill Country, this field trip takes advantage of excellent exposures along segments of the Llano and San Saba Rivers, where we have access. The Llano River portion of our trip will be done from kayaks making it even more interesting and exciting.

March 22 – 25, 2018
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Registration opens in January 2018
Trip Leader: Dr. Andre Doxler,
Rice University Professor

One day of the trip will be by kayak, starting at White’s Crossing near Mason, Texas. We will see famous exposures of microbial buildups in the Point Peak Member, Wilberns Formation. As we paddle downstream, we will have close-up views of microbial bioherms that have fallen into the river from the surrounding cliffs. As we pass gradually up-section through the Point Peak, we will have a chance to get out on the riverbank to see a variety of sedimentary structures, including mud cracks and flat-pebble conglomerates, some of which are “edgewise” conglomerates formed by strong eddy currents that spun the flat pebbles into accumulations that look like “pinwheels.” Our lunch stop will provide an opportunity to walk over a continuous exposure of stromatolitic and thrombolitic microbialites. After lunch we will see microbial bioherms with superb stromatolite accumulations at water level. This location offers a chance for close-up photos of stromatolites in cross-section. As we near the end of our float, we will be passing out of the Point Peak and through the San Saba Member of the Wilberns Formation.

The second day of the trip includes an excursion to the US Highway 87 crossing on the San Saba River. After arriving by car, we will walk along the river on both sides of the bridge to examine large ripple marks in grainstones of trilobite-brachiopod hash and microbial bioherms in vertical succession, some with well-developed stromatolitic “capping sequences” as well as thrombolitic and laminar macrostructures that are present at this location. ■

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Government Update

by Henry M. Wise, P.G. and Arlin Howles, P.G.

If you'd like the most up-to-date Texas rules, regulations, and governmental meeting information we direct you to the HGS website to review The Wise Report. This report, which comes out as needed but not more often than once a week, offers the most up-to-date information that may be of interest to Texas geologists.

AGI Geoscience Policy Monthly Review (October 2017) Senate Hearings on Interior, Environment, and Related Agencies Appropriations Bill Canceled

The Senate Committee on Appropriations has four major appropriation bills remaining to consider for fiscal year (FY) 2018, including an appropriations bill for the Department of the Interior, Environment, and Related Agencies. The bill determines the FY 2018 budget for the U.S. Geological Survey (USGS), Bureau of Ocean Energy Management (BOEM), Bureau of Safety and Environmental Enforcement (BSEE), among other agencies. During the week of October 17, 2017 both the subcommittee and full committee hearings to consider a Senate appropriations bill were canceled. Senator Thad Cochran (R-MS), the Chairman of the Senate Committee on Appropriations Committee, was not available to lead the scheduled hearings due to votes on the Senate floor and illness. The hearings have not yet been rescheduled.

Independent introduction and committee consideration of a Senate appropriations bill for the Interior, Environment, and Related Agencies may not occur before the December 8, 2017 deadline for Congress to pass all discretionary spending for FY 2018. However, appropriators suggest that it would not be unusual to have this bill wrapped into a year-end spending deal before consideration and amendment at an open Committee on Appropriations hearing.

The House of Representatives passed all 12 of their FY 2018 appropriations bills in September and is waiting on the Senate to complete action on its slate of bills.

President Trump Taps His Picks to Lead the National Oceanic and Atmospheric Administration and Army Corps of Engineers; Others Nominees Confirmed

Setting a new record by waiting longer than any other president to nominate a National Oceanic and Atmospheric Administration (NOAA) administrator, President Donald Trump officially announced his intent to nominate Barry Myers, CEO of AccuWeather, to lead the federal agency in charge of weather and climate predictions, ocean and coastal research, and fisheries management.

Some observers note that nomination of Myers, a businessman from Pennsylvania, could steer NOAA in a new direction if he chooses to refocus the nation's weather enterprise and

incentivize more private-public partnerships. The White House underscores that Myers is one of the world's leading authorities on the use of weather information and has pioneered a decade of expansive growth for AccuWeather. While previous NOAA administrators had extensive scientific backgrounds, Myers' academic background includes a bachelor's degree in business administration and economics, a master's degree in business management and organizational behavior from Pennsylvania State University, and a Juris Doctor degree from Boston University. Another player in the private weather industry, Dr. Neil Jacobs, Chief Atmospheric Scientist for Panasonic Weather Solutions, was nominated on October 3, 2017 to be the Assistant Secretary of Commerce for Environmental Observation and Prediction.

President Trump's pick to lead the Army Corps of Engineers has decades of experience with the agency. R.D. James, a self-employed farmer and a qualified civil engineer, who has served on the Mississippi River Commission since 1981. He was nominated by President Trump on October 5, 2017 to be Assistant Secretary of the Army, Civil Works.

The Senate has also confirmed a number of key agency nominees, including Stephen Censky for Deputy Secretary of Agriculture, and Ted McKinney for Undersecretary for Trade and Foreign Agricultural Affairs, both approved on October 3, 2017. Two days later, the Senate confirmed Walter Copan as Under Secretary of Commerce for Standards and Technology, and Rear Admiral Timothy Gallaudet as Assistant Secretary of Commerce for Oceans and Atmosphere.

Senator Rand Paul Introduces Bill to Reform the Federal Grant Review Process

On October 17, 2017 Senator Rand Paul (R-KY) introduced the BASIC Research Act (S.1973), a bill that would fundamentally change how the federal government reviews research grant proposals. The bill seeks to make several changes to peer review processes and broaden public access requirements for grant applications and research results. The following day, Senator Paul convened a hearing of the Senate Homeland Security and Governmental Affairs Subcommittee on Federal Spending Oversight and Emergency Management.

Government Update continued on page 28

The hearing titled “Broken Beakers: Federal Support for Research” featured testimony from three expert witnesses who addressed federal investments in research and the role of science in growing the economy, national security, and well-being of American society. Rebecca Cunningham, an Associate Vice President for Research and Professor at the University of Michigan, provided several examples of the benefits from federal funding in basic scientific research. Brian Nosek, Executive Director of the Center for Open Science and Professor at the University of Virginia, suggested that promoting a culture of transparency and reproducibility, by shifting the incentive for researchers, will improve the speed and efficiency of scientific discovery. Conversely, Adjunct Scholar Terence Kealey of the Cato Institute argued that there is no evidence indicating that the expansion of federal funding of science since World War II has substantially contributed to the U.S. economy.

The BASIC Research Act would add two new representatives to every federal panel that reviews grant applications; one representative would be an expert in a field unrelated to the research being proposed, while the other would be a taxpayer advocate for research. Applicants would not be allowed to provide recommendations as to who should or should not participate on their grant review panel. The proposed legislation would also call for all federal grant applications to be made public.

The BASIC Research Act is similar in nature to Representative Lamar Smith’s (R-TX-21) HONEST Act (H.R.1430), which passed the House on March 29. The HONEST Act amends the Environmental Research, Development, and Demonstration Authorization Act of 1978 (H.R.11302) to prohibit the Environmental Protection Agency (EPA) from proposing, finalizing, or disseminating regulations unless all scientific and technical information to support such regulations is the best available science and is made publicly available for independent analysis and reproduction of results. The HONEST Act directs the EPA to issue guidance based solely on studies whose methods, materials, and data are open and accessible. This aspect is especially contentious in the scientific community because researchers typically keep data private before they publish their research.

National Science Foundation Awards Over \$5 million in Grants to Study Hurricanes

The 2017 hurricane season is on track to be one of the most damaging and costly on record. Although the costs for Hurricanes Harvey, Irma, and Maria are still being assessed, the lowest current estimates of damage from Harvey alone fall in the \$40 to \$50 billion range, making it one of the most expensive hurricanes in American history.

In late August, 2017 Hurricane Harvey dropped more than 50 inches of rain on parts of Texas. Two weeks later, Hurricane Irma struck Florida as a Category 4 storm with maximum sustained winds of 130 mph, marking the first time in recorded history that the continental United States suffered two landfalls of such intensity within a single hurricane season. Hurricane Maria devastated the islands of Dominica and Puerto Rico as a Category 5 storm shortly thereafter, and caused catastrophic damage and numerous fatalities across the northeastern Caribbean.

In the wake of this year’s disastrous hurricane season, the National Science Foundation (NSF) has awarded 59 grants totaling \$5.3 million for projects that aim to study how hurricanes form and intensify, and how we can best respond to the devastating effects of such disasters. While these financial awards mainly support projects related to Hurricanes Harvey and Irma, NSF also expects to fund other studies related to Hurricane Maria.

According to NSF Director France Córdova, scientists funded by the agency have a long history of advancing our understanding of large-scale disasters and their aftermath. Previous NSF funding has led to the creation and deployment of underwater rescue robots to safeguard rescue workers, increased ability to predict the paths of tropical cyclones, real-time models of flood potential, and specifications for building hazard-resistant structures. In addition, researchers supported by NSF have made important discoveries regarding long-term psychological and emotional effects of disasters.

As part of the new hurricane-related grants, scientists will delve into the response and recovery of aquatic ecosystems such as lakes and rivers, the mobilization of chemical and microbial contaminants after extreme flooding, and the public health implications of post-flood disease spread. Other research will focus on how people affected by the hurricanes use social resources and how new resources can be created to assist in disaster recovery.

Lawmakers Consider Expanding Oil and Gas Leasing on the Outer Continental Shelf

The Bureau of Ocean Energy Management (BOEM) estimates that 89.9 billion barrels of undiscovered, technically recoverable oil and 327.5 trillion cubic feet of undiscovered, technically recoverable gas resources are located on the Outer Continental Shelf (OCS) of the United States. However, in its current form, the 2017-2022 OCS Oil and Gas Leasing Program bars oil and gas exploration in the Atlantic, the Pacific, and much of the Alaskan OCS. Secretary of the Interior Ryan Zinke is leading the charge to consider all potential leasing areas on the OCS and revise the leasing schedule, as directed in an executive order by President Donald Trump earlier this year. Coastal governors and state

lawmakers in Alaska, Georgia, North Carolina, and Virginia have indicated that their support of a revised OCS plan depends on the creation of a revenue-sharing program that would compensate their states for the cost of infrastructure required by OCS production and to mitigate the environmental risks presented by offshore development.

On October 11, 2017 the House Natural Resources Subcommittee on Energy and Mineral Resources met to review a draft of the Accessing Strategic Resources Offshore (ASTRO) Act, which seeks to expand access to oil and gas resources on the Outer Continental Shelf. Modeled after the revenue-sharing plan in the Gulf of Mexico Energy Security Act of 2006 (GOMESA), the bill would establish revenue sharing from oil and gas leasing for Virginia, North Carolina, South Carolina, and Alaska. The ASTRO Act would give the Secretary of the Interior the authority to conduct lease sales in areas outside an approved national leasing program. The Act would also limit the President's authority to withdraw OCS areas from leasing, and would prohibit the enforcement of the Arctic Rule, which is a 2016 rule that adds to regulations for exploratory drilling and other operations on the OCS off Alaska.

Proponents of the ASTRO Act emphasize that expanding oil and gas exploration on the OCS has the potential to ease the taxpayer burden and strengthen local and national economies. In fiscal year (FY) 2016, OCS revenues totaled \$2.8 billion, making up nearly half of all oil and gas revenues for the federal government. Senator Lisa Murkowski (R-AK), Chair of the Senate Committee on Energy and Natural Resources, supports expanding domestic energy production. However, other lawmakers and nongovernmental organizations have highly criticized the potential environmental, economic, and safety impacts of seismic testing and drilling in the OCS.

United States and Taiwan Scrap Mission for Next Generation Radio Occultation Satellites

The United States' National Oceanic and Atmospheric Administration (NOAA) and Taiwan's Ministry of Science and Technology agreed in a joint memorandum that the two agencies would halt plans to develop a second set of Constellation Observing System for Meteorology, Ionosphere and Climate (COSMIC) 2 satellites, known as COSMIC-2B. The project would have produced next-generation global positioning system (GPS) radio occultation data for weather forecasting from six high orbit satellites. The radio occultation satellite data feeds into weather forecast models, and has improved the prediction capabilities of four-day model forecasts by an additional eight hours. COSMIC-2B was initially planned to complement the low orbit COSMIC 2A satellites that are set to launch in early 2018.

The program has failed to gain significant traction due to reported funding issues for both countries since the U.S.-Taiwan agreement was signed in 2010. Under the original agreement, the Taiwanese were to provide six spacecrafts, integration of the payloads, and a mission operation center. The United States' responsibilities included providing six sensors, data recovery stations, command and control stations, and payload data processing and archival.

While the Weather Research and Forecasting Innovation Act of 2017 instructed NOAA to complete and operationalize the entire COSMIC-2 mission, no money was appropriated in the fiscal year (FY) 2017 budget, and the appropriations legislation called for NOAA to report analysis of commercial alternatives to COSMIC-2B. For FY 2018, President Donald Trump's budget request did not include funding for COSMIC-2B.

The discontinuation of the COSMIC-2B satellite project comes at a time when commercial companies are developing private GPS radio occultation systems. In FY 2016, Congress initiated a Commercial Weather Data Pilot program, with \$3 million allocated to assess the potential viability of using commercial weather data in NOAA's weather modeling and forecasting. GeoOptics, Inc. and Spire Global, Inc. were awarded contracts in September 2016 to provide space-based radio occultation data, and NOAA is now analyzing data collected by Spire Global's satellites. ■

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March 6-8, 2018
See pages 4, 8-13**



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Robert A. Chaffin

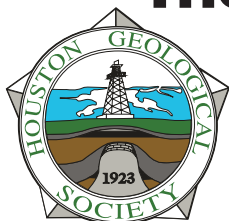
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Submit your abstract for consideration as either an oral presentation or poster, by sending it, as an email attachment, to Africa2018@hgs.org. Submissions should be sent as soon as possible and no later than March 15, 2018.

Assessment of the abstracts will be based upon the quality of the abstracts and the relevance to the suggested topics as listed below:

- African E & P in the evolving business environment - above ground risks & rewards
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- What we thought we knew – Exploration concepts to production reality

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- Each file submitted should include the principal author's surname in the file name.

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The principal author of submitted abstracts will be notified of the committee's decision no later than April 30, 2018.

Accepted Submissions:

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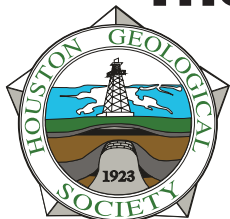
Short abstracts (up to 2 pages) will be reproduced on 8.5 x 11-inch paper and handed out at the meeting in the proceedings volume.

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Guidelines For Abstract Submission Continued

Extended Abstract (due by July 31)

Authors of accepted oral and posters are also encouraged to submit an extended abstract that may include references, appendices, figures and maps and will be eligible for higher marks within the awards system. Extended abstracts will be compiled on a CD in Adobe Acrobat (PDF) format, reproduced and distributed along with the proceedings volume of short abstracts to participants at the conference. The CD will not be secured or protected by copyright.

- Length may be several pages in length and can include B&W or color graphics.
- Include contact information for the author(s) in the abstract (email and/or mailing address).
- Page size should be 8.5 x 11 inch. A formatting template will be provided to authors of all accepted submissions to assist in preparing extended abstracts.
- Graphics can be text figures, page-sized or oversize and may be in color.
- All or part of your PowerPoint presentation can be included.
- Oversize maps or figures from your poster could also be used.

Registration

The principal author (Speaker) of each accepted submission for oral presentations and posters will receive complimentary registration to the conference.

Awards

The HGS will be recognising the best technical contributions with its prestigious awards; made by a respected panel of industry judges. The presentation ceremony will take place at the conference close.

Awards will be made for

- Best Student Poster
- Best Poster
- Best Oral Paper

Importantly authors should note that 50% of the marks from the judges will be allocated for the abstract. Also, extended abstracts are encouraged and will be eligible for higher marks within the awards system.



HGS Bulletin Instructions to Authors

All materials are due by the 15th of the month, 6 weeks before issue publication. Abstracts should be 500 words or less; extended abstracts up to 1000 words; articles can be any length but brevity is preferred as we have a physical page limit within our current publishing contract. All submissions are subject to editorial review and revision.

Text should be submitted by email as an attached text or Word file or on a clearly labeled CD in Word format with a hard copy printout to the Editor.

Figures, maps, diagrams, etc., should be digital files using Adobe Illustrator or Adobe Photoshop. Files should be saved and submitted in .ai, .eps, .tif or .jpg format. Send them as separate attachments via email or CD if they are larger than 5 MEGs each, accompanied by figure captions that include the file name of the desired image. DO NOT EMBED them into your text document; they must be sent as separate files from the text. DO NOT USE POWERPOINT, CLIP ART or Internet images (72-DPI resolution) as these do not have adequate resolution for the printed page and cannot be accepted. All digital files must have 300-DPI resolution or greater at the approximate size the figure will be printed.

Photographs may be digital or hard copy. Hard copies must be printed on glossy paper with the author's name, photo or figure number and caption on the back. Digital files must be submitted in .tif, .jpg or .eps format with 300-DPI or greater resolution at the printing size and be accompanied by figure captions that are linked by the file name of the image. The images should be submitted as individual email attachments (if less than 5 MB) or on CD or DVD.

HGS Bulletin Advertising

The *Bulletin* is printed digitally using InDesign. Call the HGS office for availability of ad space and for digital guidelines and necessary forms or email ads@hgs.org. Advertising is accepted on a space-available basis. **Deadline for submitting material is 6 weeks prior to the first of the month in which the ad appears.**

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Professional Directory Section Business Card Ad: 10 Issues – \$160 (\$30 for each additional name on same card)

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There are currently 5 opportunities to help spread the word about your business or event and generate traffic to your website or campaign. Please submit all ad materials five (5) days prior to the go-live date for testing.

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Event/Short Course Calendar Ad	\$100 – Monthly	An event ad posted within the HGS website calendar under the Events tab.
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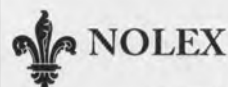
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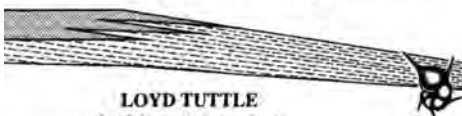
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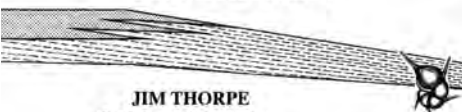
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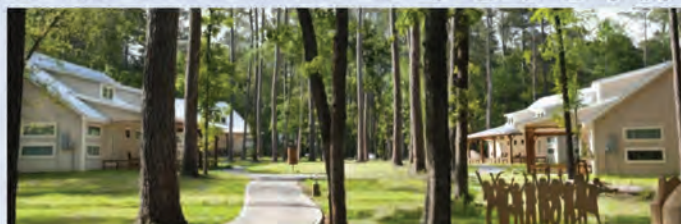
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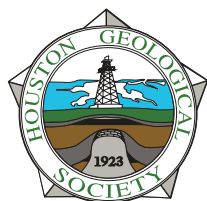
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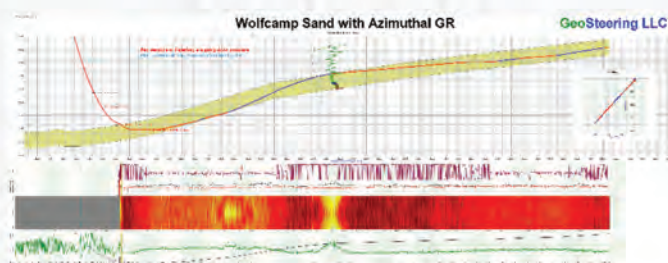
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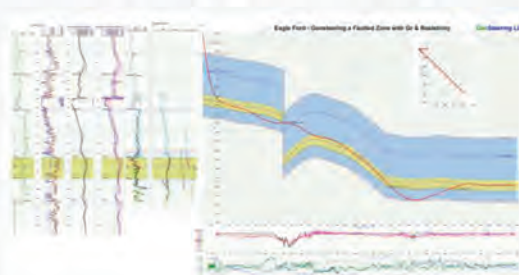
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