

# HGS Bulletin

Volume 62, Number 1

Houston Geological Society

September 2019

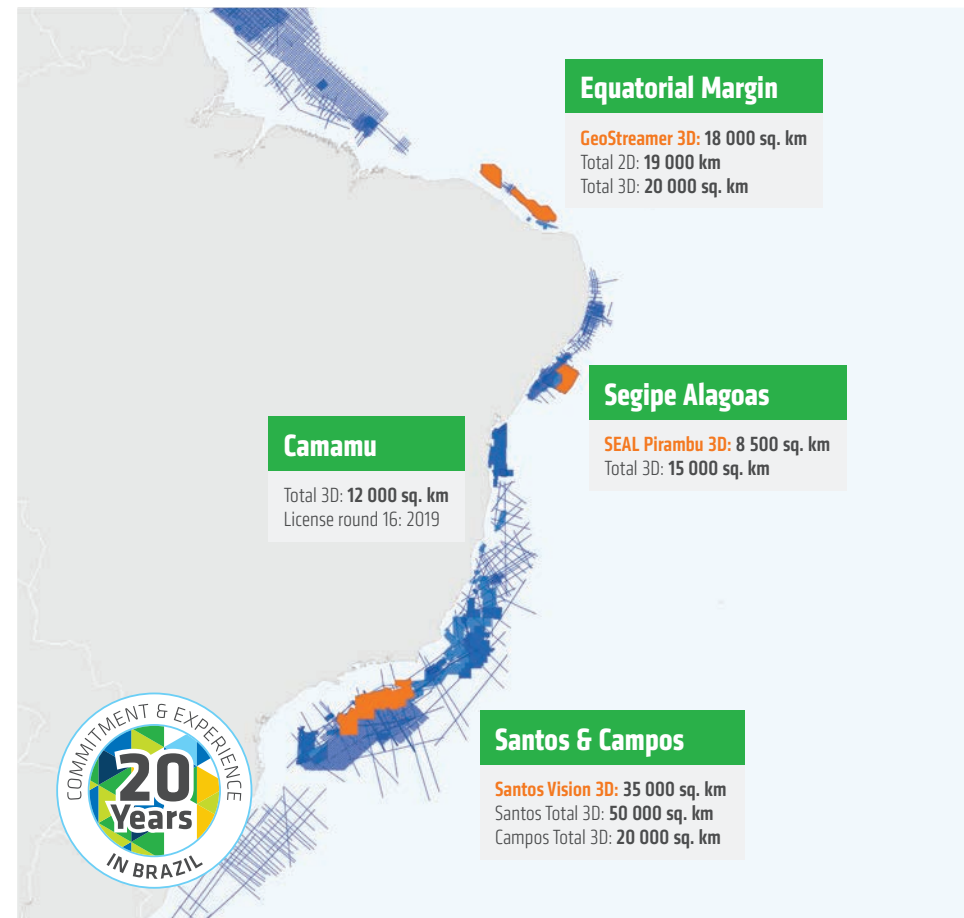
**ANADARKO PETROLEUM EXPLORATION  
LOOKBACK 2004-18: LESSONS LEARNED  
FOR CONVENTIONAL EXPLORATION RISK  
AND UNCERTAINTY PREDICTIONS  
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**POSTMASTER:** Send address changes to Houston Geological Society Bulletin, 14811 St. Mary's Lane, Suite 250, Houston, Texas 77079-2916

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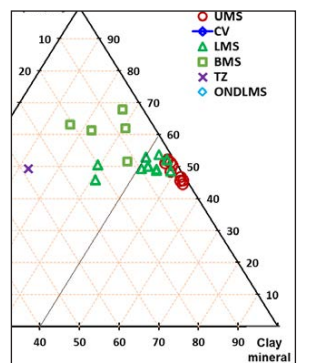
**About the Cover:** The cover photo shows the south face of Mt Kidd in Kananaskis Country, Alberta, Canada. It displays an angular fold pair and associated minor faulting that marks the northern termination of the Lewis thrust. The cliffs consist of Mississippian Livingstone and, near the top, of Mississippian Mount Head formations. The cover photo is contributed by Dr. Gregory Schoenborn at Chevron Corporation, Houston, Texas.



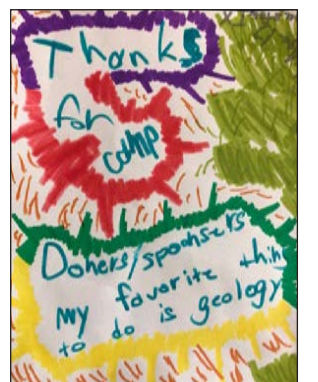
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# 2020 HGS-PESGB Africa Conference



September 15-16, 2020

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Call for Abstracts January 2020

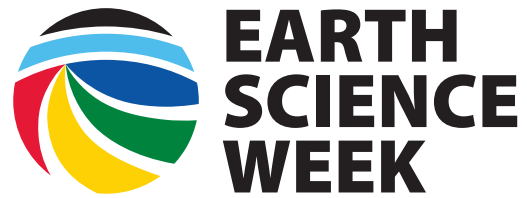
Abstract Deadline April 2020



Submit abstracts - [Africa2020@hgs.org](mailto:Africa2020@hgs.org)

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# EARTH SCIENCE WEEK

Earth Science Activities for the  
Whole Family Coming in October!

**Earth Science Week, 2018**  
October 12 – 20



HGS in partnership with the American Geosciences Institute (AGI)  
is pleased to announce the theme of Earth Science Week 2018

## Geoscience is for Everyone

This year's event emphasizes the importance of the geosciences  
in the everyday lives of all people.

**In celebration of Earth Science Week Houston,  
HGS will be hosting the following exciting events:**

**Saturday, October 12 (11:00 am – 3:00 pm)**

**Earth Science Celebration at the Houston Museum of Natural Science**

This year's event will feature hands-on geoscience activities and interactive  
science demonstrations in the Glassell Hall, Morian Paleontology Hall Lobby  
and Wiess Energy Hall.

Our popular passport program guides students through hands-on activities and  
interactive science demonstrations.

*Teachers: 2019 ESW Toolkits free with valid school ID*

**Field trip to be announced**

For more information, see the HGS Earth Science Week webpage  
<https://www.hgs.org/earth-science-outreach>



Jon Blickwede  
president@hgs.org

## Never Stop Exploring

I'd like to start off the year expressing my gratitude for having  
been elected HGS President for 2019-2020. It's a real honor,  
and I hope to finish the fiscal year with HGS being in a better  
position in all regards. And I want to express my appreciation  
for their service to all the current Executive Board officers and  
directors, committee chairs/members, and our stellar HGS office  
staff (Andi Peoples, Office Director, and Jacky Jordan, Office  
Administrator and Web Content Manager). You all play key  
roles in the day-to-day functioning and success of the Houston  
Geological Society—arguably the most important local geological  
society in the world.

I'll briefly share with you my main objectives as President at the  
end of this column, and plan to keep you updated on progress  
on these objectives in subsequent columns through the year. But  
starting with the October issue of the HGS *Bulletin*, I would like  
to devote most of this monthly space I'm allotted to focus on a  
specific theme – *Never Stop Exploring*. Whether we HGS members  
are involved in petroleum exploration, oil & gas field development,  
environmental & engineering geoscience applications, academic  
research, or other geoscientific endeavor, we geoscientists are all  
explorers at heart.

First and foremost, we explore our planet's surface and subsurface,  
and attempt to add to the collective understanding of its  
composition, structure, and its long and ineffably majestic history.  
Though there has been, in recent years, an increasing emphasis on  
the tools that we use to investigate the Earth, we should never lose  
sight of the importance of our innate human curiosity in driving  
our efforts – the curiosity to seek to explore beyond the current  
limits of our knowledge, and the simple but profound pleasure of  
perceiving something new, or something old from a new angle,  
for the first time.

This year, in which we commemorate the 50th anniversary of the  
landing of Apollo 11 on the moon, I think is an especially good  
time to reflect on our common bond as explorers, and to imagine  
what we have yet to discover “beyond the horizon.” By the way, if  
you haven't yet visited the special exhibition on Earth's moon at  
the Houston Museum of Natural Science, I highly recommend  
it: <https://www.hmns.org/exhibits/special-exhibitions/moon-by-luke-jerram/>

**So, my main objectives as 2019-2020 HGS President  
are as follows:**

1. Improve the financial “health” of HGS. This is always a  
challenge for the HGS Board, but especially so in the ongoing  
petroleum industry slump when revenue from advertising,  
conferences & meetings, and membership dues remains down.
2. Ensure a strong technical program of high interest and  
relevance to our members, which can also have a beneficial  
“knock-on” effect on objective #1. Vice President Scott Sechrist  
and others have already made significant progress in putting  
together what promises to be an excellent series of technical  
presentations at the various HGS lunch and dinner events, but  
if you have suggestions for speakers (including yourself!) and  
topics, feel free to contact Scott.
3. Increase membership, as well as the number of members  
who are active as volunteers on committees. Though we  
have been experiencing a steady increase in membership  
over the past year, the pace of the increase is too slow, and  
we are still significantly below our record high of a few years  
back. I encourage you all to consider lending your efforts and  
creativity to one of the wide range of HGS committees—take  
a look at the list of them on page 3 of the *Bulletin* and contact  
the chairperson of the committee that appeals to you the most.
4. Put together a proposal to the membership for updating the  
HGS's governing documents. The Constitution, By-Laws  
and Policy Manual of the HGS have not been revised in  
many years and require revisions in order to bring them up  
to date. For example, the HGS Board must currently have at  
least 7 of the total 12 Board members physically present in a  
meeting in order to have a quorum and make decisions. This  
limitation made sense at one time, but in this age of video/  
audio-conferencing it has become a hindrance to carrying out  
the HGS's business in an effective way. You can expect to see  
a proposal coming your way during this fiscal year, on which  
you'll be asked to vote.

I look forward to serving you during this year and meeting you  
face-to-face during many of the upcoming HGS events! ■



EAGE

EUROPEAN  
ASSOCIATION OF  
GEOLOGISTS &  
ENGINEERS



# FIRST HGS/EAGE CONFERENCE ON LATIN AMERICA

South & Central American Petroleum Plays for the Third Millennium

## SAVE THE DATE

Please submit abstracts by Sept. 1st  
to [latin.conference2019@hgs.org](mailto:latin.conference2019@hgs.org)

19-20 NOVEMBER 2019 • NORRIS CENTER, HOUSTON, TX, UNITED STATES

[www.HGS.org](http://www.HGS.org) [www.eage.org](http://www.eage.org)

## SESSIONS (AND SUB-SESSIONS)

### Offshore/deep water exploration in South America

- Central America & Northern South America (Guatemala to Panama, Northern Colombia, Venezuela, Trinidad)
- Depth horizons for exploration in the Atlantic ocean and Caribbean Sea (present challenges in the area)
- Eastern South America (Guyana through Argentina and the Falklands)
- Western South America (Western Colombia through Chile)

### Oil and gas exploration in South American foreland basins

- Conventional hydrocarbon plays
- Unconventional hydrocarbon plays (e.g., Neuquén Basin of Argentina)
- Oil and gas exploration in South American Pre-Andean rift basins
- Geological and geophysical exploration in South American Pre-Andean rift basins
- The role of remote-sensing in oil and Gas exploration in South America

### Oil Systems of the region and the challenges in the production

- Techniques and methodologies applied in Latin America for the oil and gas production (drilling systems)
- Carbon Capture and Storage (CCS) case in Brazil and Argentine
- Hydraulic Fracturing
- Geophysics applied in the oil and gas production
- EOR/ IOR

### Special sessions

- Natural resource and technological contents of Latin American as an energy supplier
- Environmental sustainability

From the  
Editor

From the  
Editor



Fang Lin  
[editor@hgs.org](mailto:editor@hgs.org)

## Fellow Houston Geological Society Members:

First of all, thank you for reading this letter. I understand it is an investment of you time, so I will try to make it as succinct as possible.

In this first issue of the Houston Geological Society (HGS) *Bulletin* for the 2019-2020 fiscal year, please allow me to tell you a little about myself. I am a mid-career geologist who has worked in the energy industry for 14 years. I obtained my bachelor's in geology and master's in ore deposit geology, respectively, 20+ years ago. I obtained my doctorate degree in geochemistry in 2005. Since then, I have been working for Chevron Corporation in Houston, Texas.

Reflecting on my path of becoming a geology major in college and later becoming a petroleum geologist in industry, I feel it was a bit fortuitous. The good news is that I have fully enjoyed my journey, and I know that many people have helped me to stay on the track. There were professors who intrigued me with questions that I wanted to answer. There were colleagues who presented me with real-life challenges that I wanted to resolve. There were mentors who guided me through down times so that I did not give up.

As the energy industry continues to recover from a downturn, we have seen low enrollments in geology departments in some universities around the country. We have also seen some of our fellow geologists trying very hard to stay active within the geologic community. Meanwhile, we know that there are still many unresolved problems that await earth scientists to tackle. Society still needs energy and other natural resources for the foreseeable future. Therefore, we need to maintain and grow the talent of geologists both in academia and in industry. My question

is – can each of us do something to help with that? Volunteering at a local school to introduce geology to school children? Mentoring a young geologist who just started his or her career? Helping a fellow geologist to establish his or her own business? Or just sharing the stories about our journeys as geologists and what kept us on our path.

I invite you to write to me, as the Editor of the HGS *Bulletin*, to share your stories, knowledge and insights. The exciting moments in your career, the most striking beauty that you have observed in the field, or simply the questions that you would like a fellow geologist to help with, or suggestions about what HGS can do more for our members, all are welcome. Let's try to help each other out as a community. I look forward to hearing from you!

Yours sincerely,

Fang Lin

**ERRATUM:** While we strive to provide the most accurate information to our readers, occasionally an error slips past our proofreaders.

We are sorry to report that the statement about Mr. Bill Dupré in the June 2019 issue of the HGS *Bulletin* (page 35, last sentence of 1st paragraph) is incorrect. It stated that "He currently serves on the board of the Bayou Preservation Association". However, Bill is no longer serving on the board of the Bayou Preservation Association.

### Letter to the Editor

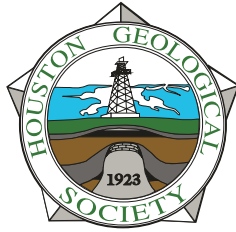
## Fundraising Effort For Charles Lyell's Notebooks

Charles Lyell (1797-1875) is well known as a key figure in history of geology. The Lyell archive is one of the most important manuscript collections relating to nineteenth century science still in private hands. At its core are 294 notebooks, which provide a daily record of Lyell's private thoughts, travels, field observations and conversations. In order for the family to meet an inheritance tax, the Lyell notebooks were sold to an

unknown foreign buyer towards the end of last year. Fortunately, the UK government imposed a temporary export ban to enable **fundraising to purchase these remarkable documents, conserve them, and make them available on-line for free to the public.** The University of Edinburgh Library, which already has the largest collection of Lyell material, is organizing the donation campaign.

Fundraising Effort continued on page 37





# HGS GOLF TOURNAMENT

Monday – October 21, 2019  
Sterling Country Club and  
Houston National Golf Club  
4-man Scramble

Come join us for golf, food, friends and fun at the annual HGS Golf Tournament at our new location, **Sterling Country Club** and **Houston National Golf Club** ([www.sccathn.com](http://www.sccathn.com)). There will be prizes awarded for closest to the pin and long drive as well as many great door prizes for participants.

**Entry Fee:** \$175.00/Golfer or \$700.00/Team.  
**Early Bird Special:** Sign up before September 23rd to receive a discount of \$25.00/Golfer or \$100/Team.  
**Entry Deadline:** October 14th.

Individual entries will be grouped with other individual golfers to make a foursome. Entries are limited to and will be accepted on a first-in basis.

Companies or individuals interested in sponsoring the event should contact Elliot Wall at [elliott.wall@corelab.com](mailto:elliott.wall@corelab.com) and copy [office@hgs.org](mailto:office@hgs.org) *Sponsorship deadline is September 30th.*

**SCHEDULE OF EVENTS**

8:00 – 9:45 a.m. Registration and free use of driving range and mini games, breakfast provided  
10:00 a.m. Shotgun start  
3:00 p.m. Cash bar, open buffet  
3:30 p.m. Door prizes and awards presentation



**REGISTRATION OPTIONS**

**Online:** <https://www.hgs.org/civicrm/event/info?id=2095&reset=1>

**Email:** [office@hgs.org](mailto:office@hgs.org) and [elliott.wall@corelab.com](mailto:elliott.wall@corelab.com)

**Mail:** Houston Geological Society, 14811 St. Mary's Lane, Suite 250, Houston, TX 77079  
*If paying by check, please make check payable to HGS or Houston Geological Society.*

Team Captain \_\_\_\_\_ Phone \_\_\_\_\_ Amount Enclosed \_\_\_\_\_

Company \_\_\_\_\_ Email \_\_\_\_\_

Billing Address \_\_\_\_\_

Credit card # \_\_\_\_\_ Exp. Date \_\_\_\_\_ Code# \_\_\_\_\_

**Please Provide Email Addresses For All Team Members. All Communications Will Be Done Via Email.**

Foursome Members (Please Print)	Company	Phone Number/Email	Hdcp/ Avg. Score
1. _____	_____	_____	_____
2. _____	_____	_____	_____
3. _____	_____	_____	_____
4. _____	_____	_____	_____

*Please provide email addresses for all team members. All communications will be done via email.*



# HGS GOLF TOURNAMENT

Monday – October 21, 2019  
Sterling Country Club and  
Houston National Golf Club

## SPONSORSHIP APPLICATION

### TREVINO SPONSORSHIP \$250.00

- Sponsor Logo signs on courses.
- Company Name displayed on sponsor recognition board at registration and awards banquet.
- No Complimentary Registration

### HOGAN SPONSORSHIP \$500.00

- Sponsor logo signs on courses.
- Company logo displayed on sponsor recognition board at registration and awards banquet.
- 1 Complimentary Registration

### NICKLAUS SPONSORSHIP \$1,000.00

- Sponsor Logo signs on courses.
- Company Logo prominently displayed on sponsor recognition board at registration and awards banquet.
- Company logo displayed on driving range and practice putting green signs.
- 2 Complimentary Registrations

### TITLE SPONSORSHIP \$2,000.00

- Sponsor logo signs on courses.
- Company logo prominently displayed on sponsor recognition board at registration and awards banquet.
- Company logo displayed on driving range and practice putting green signs.
- Company logo displayed on beverage carts.
- Sponsorship includes tournament entry for one team (4 people).



**SPONSORSHIP REGISTRATION OPTIONS – Deadline October 15th**

**Online:** <https://www.hgs.org/civicrm/event/info?id=2095&reset=1>

**Email:** [office@hgs.org](mailto:office@hgs.org) and [elliott.wall@corelab.com](mailto:elliott.wall@corelab.com)

**Mail:** Houston Geological Society, 14811 St. Mary's Lane, Suite 250, Houston, TX 77079  
*If paying by check, please make check payable to HGS or Houston Geological Society.*

Name \_\_\_\_\_ Phone \_\_\_\_\_ Amount Enclosed \_\_\_\_\_

Company \_\_\_\_\_ Email \_\_\_\_\_

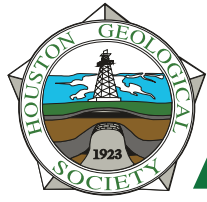
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Credit card # \_\_\_\_\_

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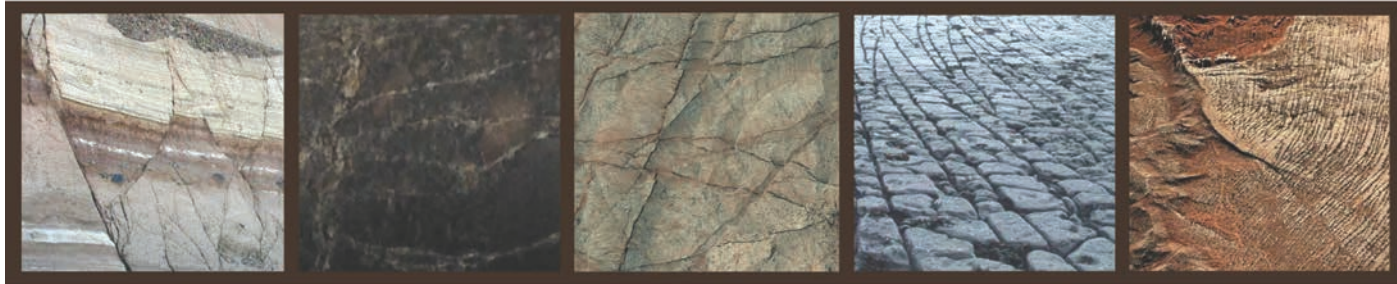
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If there are any questions, please contact Andrea Peoples or Jacky Jordan at 713-463-9476.**



# Applied Geoscience Conference

November 6-7, 2019

SOUTHWESTERN ENERGY • 10000 Energy Drive • Spring, TX 77389



## Applied Geomechanics: Through the Life Cycle of the Field

Day 1 AM Session 1 Accessing Targets Faster with Safer Wellbores

**Lunch Keynote** **Robert W. Zimmerman**, *Imperial College, London*

Day 1 PM Session 2 Optimizing Completion Footprint and Stimulation Designs

Day 2 AM Session 3 Post-stimulation Diagnostics and Monitoring

**Lunch Keynote** **Tony Settari**, *CGG Services (Canada) Inc.*

Day 2 PM Session 4 Extending the Life of the Field: Production, Refracturing, and EOR

University Poster Session represented by: Georgia Tech, Oklahoma State University, Purdue University, University of Calgary, University of Houston, University of Oklahoma, University of Texas, Utah State University

**This Fourth Applied Geoscience Geomechanics Conference (since 2013) by an industry expert committee provides the highest value through invited subject matter experts represented by:**

*Baker Hughes GE, CGG, Carboceramics, Excellence Logging, FracGeo Halliburton, Optasense, Saudi Aramco, Schlumberger, Weatherford*

### Cost structure

General registration: July 1 – November 5, 2019

HGS member \$400.00

Non-member \$455.00

HGS student member \$75.00

Note: Unemployed HGS members contact the office for discount

For more information please visit [www.hgs.org](http://www.hgs.org) or contact the HGS office: [office@hgs.org](mailto:office@hgs.org)



# Applied Geoscience Conference

November 6-7, 2019

## Oral Presentations – Wednesday, November 6, 2019

7:00	Registration and Coffee	
8:00 - 8:10	<b>Welcome and Opening Remarks:</b> Jon Blickwede, HGS President; Umesh Prasad, <i>Baker Hughes, a GE company</i> ; SWN representative	
<b>Session 1: Accessing Target Faster with Safer Wellbores</b> <b>Chairs:</b> Lauren Cassel; Mark Herkommer, <i>Excellence Logging</i>		
8:10 - 8:45	Advanced Seismic Inversion for Geomechanics Applications in Unconventional Reservoirs	<b>Colin Sayers</b> , <i>Schlumberger</i>
8:45 - 9:20	Lost-in-hole Diagnostics and Mitigation	<b>Agus Tjengdrawira</b> , Julie Kowan, and Namsu Park, <i>Baker Hughes, a GE company</i>
9:20 - 9:40	Coffee, Posters, Exhibits	
9:40 - 10:15	Laboratory Modelling of Salt Deformation and its Correlation with Drilling Mechanics of Record Hybrid Drill Bit Runs in the GOM	<b>Ashabikash Roy Chowdhury</b> , Umesh Prasad and Ryckman Callais, <i>Baker Hughes, a GE company</i>
10:15 - 10:50	Novel Pore Pressure Prediction Technique for Unconventional Reservoirs	<b>David P. Yale</b> , Adriana Perez, and Robert Raney, <i>Geomechanics Consulting</i>
10:55 - 11:55	Open Floor Discussion & Posters	
11:55 - 1:00	Lunch, Posters, Exhibits	
12:15 - 1:00	<b>Chair:</b> Deepak Gokaraju, <i>Metarock Laboratories</i> <b>Keynote:</b> Failure of Anisotropic Rocks such as Shales, and Implications for Borehole Stability	<b>Robert W. Zimmerman</b> and Widad Al-Wardy, <i>Dept. of Earth Science and Engineering, Imperial College of Science, Technology and Medicine, London, UK.</i>
<b>Session 2: Optimizing Completion Footprint and Stimulation Designs</b> <b>Chairs:</b> Haleigh Howe, <i>Weatherford</i> ; Mark Morford, <i>Fracgeo</i>		
1:05 - 1:40	Digital Rock Simulation: A Novel Approach for Accurate Characterization of Perforation Tunnel Damage	<b>Rajani Satti</b> , <i>Baker Hughes, a GE company</i>
1:40 - 2:15	Digital Twins for Drilling Fluid and How Digitalization Could Help to Reduce the Cost and Increase the Wellbore Stability	Mehrdad G Shirangi, <b>Reza Ettehadi</b> , and Charles A Thompson Jr, <i>Baker Hughes, a GE company</i>
2:15 - 2:35	Coffee, Posters, Exhibits	
2:35 - 3:10	Stress Sensitivity of Sonic Wave Velocity and the Reliability of Sonic Tools in Unconventional Tight Gas Sand Reservoirs	<b>Dr. Christophe Gernay</b> and Tanguy Lhomme, <i>EPSLOG</i>
3:10 - 3:45	Characterizing Off-Normal Occurrence and Leakage Risk at Underground Natural Gas Storage Facilities	<b>Richard A. Schultz</b> , <i>Orion Geomechanics</i>
3:45 - 4:45	Open Floor Discussion & Posters	
5:00 - 8:00	Social Hour • Booths • Posters	





# Applied Geoscience Conference

November 6-7, 2019

## Oral Presentations – Thursday, November 7, 2019

7:00	Registration and Coffee	
8:00 - 8:10	Welcome and Opening Remarks: Umesh Prasad, Baker Hughes, a GE company	
	<b>Session 3: Post-stimulation Diagnostics and Monitoring</b> Chairs: David Katz, Baker Hughes, a GE company; Jing Zhang, University of Oklahoma PH D Student	
8:10 - 8:45	Geomechanics of Unconventional Hydraulic Fracturing Clusters, Complexity, “Frac-Hits” and All That	Professor Ahmas Ghassemi, The University of Oklahoma
8:45 - 9:20	Estimation of Propped Fracture Geometry Using Electromagnetic Geophysics	Terry Palisch, Carboceramics
9:20 - 9:40	Coffee, Posters, Exhibits	
9:40 - 10:15	Near and Far Field DAS Diagnostics for Unconventional Reservoir Monitoring	Andres Chavarria, Optasense
10:15 - 10:50	Early Warning Systems – Using PTA Analysis of DFITs to Understand Complex Hydraulic Fractures and Optimize Treatment Designs	Bob Bachman, CGG
10:55 - 11:55	Open Floor Discussion & Posters	
11:55 - 1:00	Lunch, Posters, Exhibits	
12:15 - 1:00	Chair: Deepak Gokaraju, Metarock Laboratories Keynote: Integrating Geology and Geophysics into Engineering Workflows to Enhance Unconventional Production	A (Tony) Settari, CGG
	<b>Session 4: Extending the Life of the Field: Production, Refracturing, and EOR</b> Chairs: Barbara Hill, Schlumberger; Chi Vinh Ly, CGG	
1:05 - 1:40	Role of Multiple Fracturing of Vertical And Horizontal Wells in Maximizing Production and Extending Life of the Field	Professor Mohamed Soliman, University of Houston
1:40 - 2:15	Limits on the Accuracy of Pore Pressure Estimates by Analysis of Random Measurement Error and Means for Improvement	Mark Herkommer, Excellence Logging
2:15 - 2:35	Coffee, Posters, Exhibits	
2:35 - 3:10	Extending the Life of Enhanced Permeability Zones Created During Hydraulic Fracturing	Ron Dusterhoft, Z Philips and U Inyang, Halliburton
3:10 - 3:45	Predrill Pore Pressure Estimation in Wildcat Prospectivity	Saad T. Saleh, GEOMECH, USA
3:45 - 4:45	Open Floor Discussion & Posters	
	Closing Comments and Invitation to Posters	

### Poster Session

Invited Presentations from Graduate Students • Open during Coffee and Lunch Breaks



# Applied Geoscience Conference

November 6-7, 2019

## Posters – November 6-7, 2019

Poster Session Chair: Mike Effler		
University	Student Name	Poster Topic
Georgia Institute of Technology	Ming Lui	Poroelastic Indentation – Feasibility of a New Testing Method for Tight Rocks
Oklahoma State University	Jingyao Meng	Geomechanical Characteristics of the Prospective CO <sub>2</sub> Sinks and Seals, Eastern Gulf of Mexico
Purdue University	Wenging Wang	Heterogeneous Stress State in the Crystalline Crust Beneath the Western Canadian Sedimentary Basin: Observations from Borehole Image Logs to 2.4 km
The University of Oklahoma	Zhi Ye	The Role of Pre-Existing Fractures in Shale Reservoir Stimulation
The University of Oklahoma	Juan Acosta	Study of Creep Behavior in Barnett Shale Using Nano-Indentation
The University of Texas	Mehdi Teymouri	Coupled Hydro-Mechanical Analyses and Modeling for Reliable Characterization of Fracture Propagation in Anisotropic and Spatially Heterogeneous Formations
The University of Texas	Shivam Agrawal	Effect of Rock Heterogeneity at Different Length Scales on Fracture Geometry
University of Calgary	Marco Venieri	Predicting Reservoir Potential of Unconventional Shale Plays from Wireline Logs: A Correlation Between Compositional and Geomechanical Properties of the Devonian Duvernay Formation, Alberta, Canada
University of Houston	Abdullah Bilal	Predicting Static Data, Using Dynamic Properties and Quantitative Sample Characterization
University of Houston	Suresh Dande	Elastic Properties of Propped and Unpropped Eagle Ford Shale and 3D-printed Fractured Rock Models
University of Houston	Rongrong Lin	A Damped Dynamic Finite Difference Approach for Modeling Static Stress-Strain Fields
University of Houston	Sabyasachi Prakash	Analysis of Unconsolidated Sands’ Yielding Behavior Under Unloading Conditions

### Participating Schools

Georgia Institute of Technology • Oklahoma State University  
Purdue University • The University of Oklahoma  
The University of Texas • University of Calgary  
University of Houston



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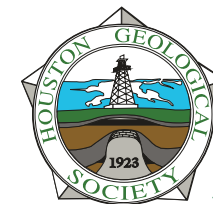
**93%** Rated the overall quality of the technical presentations as good or exceptional compared to other industry conferences

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

**91%** Rated the talks as applicable to their every day work

For more information and to register please visit: [www.hgs.org](http://www.hgs.org)



# Applied Geoscience Conference

November 6–7, 2019

## Applied Geomechanics: Through the Life Cycle of the Field

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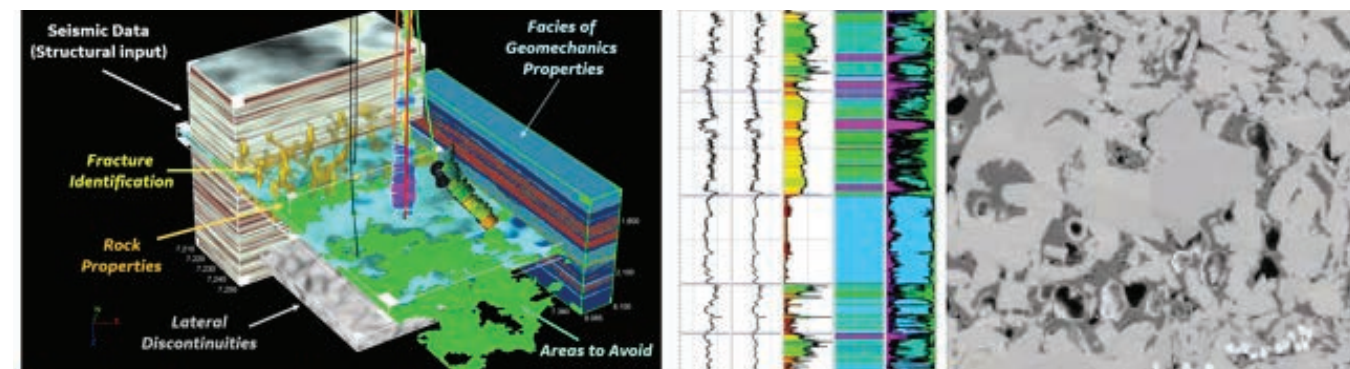
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GEOSCIENTISTS &  
ENGINEERS



# FIRST HGS/EAGE CONFERENCE ON LATIN AMERICA

South American Petroleum Plays for Future Decades of the Third Millennium

## SPONSORING

19-20 NOVEMBER 2019 • NORRIS CENTER, HOUSTON TX, UNITED STATES

## WELCOME TO

the First HGS/EAGE Conference on Latin America themed “South American Petroleum Plays for Future Decades of the Third Millennium”

We are pleased to welcome you to the 1<sup>st</sup> HGS/EAGE meeting on Latin America that will take place in Houston, USA from 19–20 November 2019. We are excited to offer you this interesting event in Houston. It will bring together the knowledge of two well known societies, namely HGS and EAGE, the European Association of Geoscientists and Engineers.

While the petroleum industry is still experiencing the biggest economic downturn seen for decades, our industry-based colleagues and academics continue to bring new tools, influence and understanding to exploration and production activities. The world needs energy and therefore it needs you to participate in events like this. The downturn also offers opportunities especially in the field of new technologies and efficiency.

We strongly believe that the joint HGS/EAGE 2019 event will bring together a strong, successful conference focused on Latin America and widely attended by academic and industry participants. We are preparing a program with broad appeal, scientific focus, and networking opportunities. We are expecting 300 participants from the US, Europe, and Latin America with oral and poster presentations. In addition, an exhibition is present to facilitate knowledge transfer and business among the Geoscience community.

On behalf of the committee, we hope to see you in Houston!

**Cheryl Desforges, Mariela Araujo Fresky, and Steven Getz**  
*Conference chairs*

## EAGE

The European Association of Geoscientists and Engineers (EAGE) is a global professional, non-profit association for geoscientists and engineers with 19,000 members worldwide. The objective is to collect and distribute technical knowledge. EAGE organizes events and publishes a monthly magazine for its members and 5 scientific journals. All members of EAGE are professionally involved in (or studying) geophysics, petroleum exploration, geology, reservoir engineering, mining, and mineral exploration, civil engineering, tunneling and environmental matters. EAGE's Head Office is located in the Netherlands with regional offices in Moscow, Dubai, Kuala Lumpur, and Bogota.

## HGS

The Houston Geological Society is a professional society for petroleum, energy, and environmental geoscientists. The HGS supports continuing education, networking, outreach to students, student scholarships and young professional activities, such as neoGeos. HGS organizes multiple monthly events and publishes a monthly magazine for its members. This monthly magazine is also published in the AAPG Datapages. HGS is comprised mainly of petroleum geologists (but some are mining and environmental geologists.) Our associated members (who are not degreed geologists) include: geophysicists, petrophysicists, engineers (petroleum and civil) as well as mineral explorationists and environmentalists. Headquarters for the HGS is in Houston, Texas.





### CONFERENCE OVERVIEW

Tuesday 19 November opening, Conference  
Wednesday 20 November, Conference

## SESSIONS (AND SUB-SESSIONS)

### Offshore/deepwater exploration in South America

- Central America & Northern South America (Guatemala to Panama, Northern Colombia, Venezuela, Trinidad)
- The deep horizons for exploration in the Atlantic Ocean and the Caribbean Sea (present challenges in the area)
- Eastern South America (Guyana through Argentina and the Falklands)
- Western South America (Western Colombia through Chile)

### Oil and gas exploration in South American foreland basins

- Conventional hydrocarbon plays
- Unconventional hydrocarbon plays (e.g., Neuquén Basin of Argentina)
- Oil and gas exploration in South American Pre-Andean rift basins
- Geological and geophysical exploration in South American Pre-Andean rift basins
- The role of remote- sensing in the oil and Gas exploration in South America

### Oil Systems of the region and the challenges in the production

- Techniques and methodologies applied in Latin America for the oil and gas production (drilling systems)
- Carbon Capture and Storage (CCS) case in Brazil and Argentina
- Hydraulic Fracturing
- Geophysics applied in the oil and gas production
- EOR/ IOR

### Special sessions

- Natural resource and technological contents of Latin American as an energy supplier
- Environmental sustainability

## EXHIBITING OPPORTUNITIES

Main reason for exhibiting:

- Meet existing and acquire new customers
- Introduce new products and services
- Demonstrate your technology and equipment
- Monitor the competition!
- Expand your network

### Exhibitors benefits

When booking a stand for HGS/EAGE 2019 exhibitors will benefit from the following:

- 2 exhibitors passes good for admittance to the exhibit hall only
- Exposure on the EAGE and HGS website
- Free access to the receptions
- Free lunches

To secure booth space, please complete the contract at the end of this guide and send it to us by email ([office@hgs.org](mailto:office@hgs.org)). Please note that all incoming contracts will be handled on first come first served basis.

## SPONSORING OPPORTUNITIES

With an array of unique promotional opportunities, we can help you design the perfect program to enhance your company's experience at HGS/EAGE 2019.

### Why become a sponsor

When you are a corporate sponsor you get high visibility in a qualitative and uncluttered environment that makes your message stand out. HGS and EAGE events are synonymous with quality, with proven track records in the past. The HGS/EAGE 2019 program offers a diverse menu that will surely help you reach your target audience.

Sponsoring will enable you to:

- Increase your visibility before a national, regional and international audience.
- Enhance your corporate image.
- Reach an influential, exclusive audience.
- Break through the media clutter.
- Associate your company with HGS and EAGE

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# FIRST HGS/EAGE CONFERENCE ON LATIN AMERICA

## SPONSOR CONFIRMATION

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**Exhibitor's booth fee of \$2,000.00**

EXHIBIT SPACE ORDER \$2000.00 per 10' X 10' booth space: \_\_\_\_\_ booth(s) + \_\_\_\_\_ presentation(s) = \$

Contact the HGS office for booth selection 713-463-9476 Booth #

Do you require Internet access at your booth?  Yes  No  
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<input type="checkbox"/>	\$9,000	\$4,500 Day Two Reception – 2 Drinks plus Food	
<input type="checkbox"/>	\$5,000	\$2,500 Flash Drive of Extended Abstracts	
<input type="checkbox"/>	\$5,000	\$2,500 Technical Session Day 1	
<input type="checkbox"/>	\$5,000	\$2,500 Technical Session Day 2	
<input type="checkbox"/>	\$5,000	\$2,500 Breakfast Day One	
<input type="checkbox"/>	\$5,000	\$2,500 Breakfast Day Two	
<input type="checkbox"/>	\$5,000	\$2,500 AV Equipment and Services	
<input type="checkbox"/>	\$5,000	\$2,500 AM & PM Break Food & Beverage Day One	
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## HGS International Dinner Meeting

**R. Brent Boyd**  
Senior Geophysical Advisor,  
Project Advancement Team  
Anadarko Petroleum Corp

Monday, September 9, 2019

Norris Conference Centers • 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.

# Anadarko Petroleum Exploration Lookback 2004-18: Lessons Learned for Conventional Exploration Risk and Uncertainty Predictions

From 2004 through 2018, Anadarko Petroleum drilled over 250 exploration wells around the world. That effort led to the discovery of over 15 Billion barrels of oil equivalent. This success was not due to chance, but a concerted effort by Anadarko to add long-term corporate value through Exploration. In 2004, Anadarko management created a Risk Consistency Team, a group of experienced geoscientists and engineers, to evaluate the risk and resource range of volumes before every exploration well was drilled. The Anadarko explorationists estimated a chance of geologic success and a range of success-case resource volumes for each pre-drill evaluation. After the well was drilled, the exploration team analyzed the success or failure of each well and whether the discovered resource volumes fell within the pre-drill range of uncertainty. At the end of each year, the Risk Consistency Team analyzed the results and presented the lessons learned from the exploration drilling program to the Anadarko exploration community.

Anadarko explorationists were very good at predicting the success rate for wells whose chance of success was in the 30-80% range. Anadarko had no successful exploration well with a chance of success under 20%, but the sample size was small. For wells estimated to fall between 20-29% chance of success, Anadarko was too conservative. Above 80%, the teams were too optimistic.

Significant lessons can be learned when viewing exploration results over a 15-year period at Anadarko. The biggest lesson is that exploration success must start with a healthy prospect portfolio. A healthy portfolio is deep, continually updated, regularly high-graded and keeps pace with drilling activity. Anadarko had a tremendous run of new field discoveries from 2009-13. After that time, exploration success dropped off. This lookback shows that the lower success rate can be tied to the lower number of prospects being evaluated by the exploration teams, thus leaving fewer quality options for a drilling inventory.

Another lesson is that successfully predicting risk and uncertainty in an exploration program depends on drilling a statistically significant number of wells. In the years when Anadarko was drilling over 10 exploration wells per year, the teams were very good at predicting chance of success and resource range of volumes. Conversely, the years when fewer wells were drilled are the years that exploration teams had the hardest time making predictions.

Finally, a tendency present throughout the 15-year lookback was that resource range predictions were skewed toward over-promising and under-delivering volumes. The Risk Consistency Team continued to address this concern by focusing on the small-volume (P99) end of the resource range and making sure those volumes were very small. Even so, this tendency was never fully overcome. ■

### Biographical Sketch

**R. BRENT BOYD** has a 34-year career in oil and gas exploration. He graduated in 1985 with a B.S. in Geophysics from Texas A&M University. He started working for Arco Oil and Gas that year, spending time over the next few years in Plano and Midland exploring for hydrocarbons in the Permian Basin. In 1993, he was transferred to Vastar Resources in Houston, where he worked in the Mid-Continent exploration team. In 2000, Brent left for Anadarko Petroleum and has spent most of the remaining 19 years working African basins for oil and gas opportunities. In 2018, he was named to the Project Advancement Team, tasked with reviewing the geologic and economic risk and uncertainty assumptions for all Anadarko Exploration and Development drilling projects. Brent is currently in the middle of a three-year term on the HGS Board of Directors.



Wednesday, September 11, 2019

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

Troy Meinen  
Environmental Resources  
Management

### Is There Anything Dangerous Down There? Mitigating the Dangers of Digging, Trenching, and Drilling

All too often the news is filled with stories of evacuations, flooding, and in many cases injuries or death as the result of damage to underground lines. Whether digging with hand tools or machines, trenching, drilling borings, or simply cutting concrete, it is very easy to damage underground lines. Sometimes the consequences of striking underground lines are an inconvenience, such as in a recent event where a project team conducting hand dug pits for an archeological study unintentionally punctured an HDPE water line interrupting the water supply to an agricultural field. Many times, however, the consequences are much more severe as evidenced by recent examples of gas line explosions and electrical burns resulting from damage or impact to underground lines.

A robust pre-planning exercise before digging can greatly minimize the risk of hitting or damaging underground lines. Elements of planning should include, at a minimum, one call notification, a review of known information about a location, visual surveys, and conversations with knowledgeable people. Prior to selecting locations, technology can be used to trace known lines, and in many cases, assess potential obstructions in the ground. Finally, non-destructive excavation methods can greatly reduce the potential to damage underground lines.

This presentation will review industry practices for pre-planning ground disturbance activities, as well as the pros and cons of many non-intrusive technologies for tracing or locating lines. In addition, alternative technologies for physically uncovering lines or safely conducting excavations will be discussed. ■

#### Biographical Sketch

TROY MEINEN is a Technical Director and Global Health and Safety Advisor with ERM in Houston. Over his 20-year career, he has worked on a wide variety of industrial facilities and upstream oil and gas projects to address contaminated ground water, soil and sediment issues. His background includes managing investigation and remediation of upstream oil and gas sites and assisting with due diligence for large oil and gas acreage position transactions for major Oil and Gas clients, which includes assessment of water use and protection, property transaction support, environmental impact assessment, environmental permitting and management, and Stakeholder concerns. He currently utilizes his field experience to support teams globally in improving health and safety performance in key ERM accounts.



Monday, September 16, 2019

Norris Conference Centers • 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.

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## HGS & AWG Joint General Dinner Meeting

Mary Van Der Loop  
Sanctuary Oaks Consultants Int'l

### Joint Dinner with AWG

### Paleo Overpressure in the Delaware Basin Determined from DST, Resistivity and Mud Logs

The Wolfcamp overpressured cell in the central portion of the Delaware Basin, West Texas, was first defined by early drilling of deep gas prospects in the 1960's. Blowouts, increased mudweights, liner and casing seat data provided empirical data on the overpressured section. This analysis uses Mud Weights, AIFE Drill Stem test pressures and Resistivity Logs to define the overpressured cell, and suggests the presence of a paleo-overpressured sedimentary section in the Delaware Basin.

Mud Weight data was gathered on 356 deep Delaware basin wells. These mudweights were converted to pressure gradient data to define overpressured areas against a Permian Basin normal hydrostatic gradient of .48 psi/ft. AIFE Drill stem test data is scant as Wolfcamp reservoirs were seldom tested and were impermeable in general, but extrapolation of DST pressures to reservoir pressure was useful in seventeen wells to define a DST derived pressure gradient.

Resistivity trends with depth in normally pressured areas show an increase of resistivity with increasing depth, however given similar lithology, resistivity drops in an overpressured section. The Delaware Basin low resistivity overpressured shale section shows a similar response as in other overpressured basins such as the Gulf Coast and Anadarko Basins.

A relationship between shallow resistivity trend vs overpressured resistivity measurement, and measured pressure gradient was established using the AIFE DST database. Using that relationship to

convert resistivity data to pressure gradient data; 92 resistivity logs were selected for derivation of Pressure Gradient; 43 of these wells had an accompanying Mud Weight derived Pressure Gradient.

Mud weight derived pressure gradients show a current area of overpressure smaller than the area shown by the Resistivity derived Pressure Gradient data, even when accounting for lithologic changes. It is suggested that overpressure in the Delaware Basin was more prevalent before Laramide Uplift. A similar paleo-overpressure phenomenon has been interpreted for equivalent observations in the Anadarko Basin; both basins have a similar uplift and erosion history. <https://www.abstractsonline.com/pp8/#!/6795/presentation/5669> ■

#### Biographical Sketch

MARY VAN DER LOOP is an AAPG Certified Petroleum Geologist with over 40 years of experience in the oil and gas industry. She is owner of Sanctuary Oaks Consultants International, Inc., a geological consulting firm located in Flatonia, Texas. Mary holds a bachelor's degree in geology from University of Wisconsin, Madison, and a master's degree in geology from University of Texas at Arlington.







Tuesday, September 17, 2019

Southwestern Energy Conference Center, 10000 Energy Drive, Spring, TX 77389  
Social 11:15 a.m., Luncheon 11:30 a.m.

Cost: \$35 Preregistered members; \$40 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 Northsiders Luncheon Meeting

Lucy T. Ko

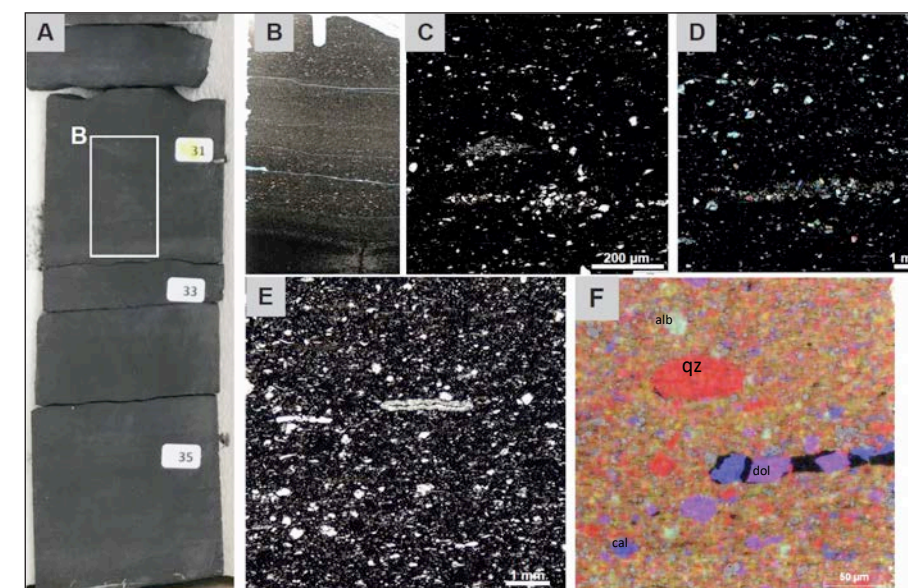
Bureau of Economic Geology, Jackson School of Geosciences, The University of Texas at Austin

# Facies, Depositional Environments, Chemostratigraphy, and Reservoir Quality of the Middle Devonian Marcellus Formation, Appalachian Basin, Northeastern Pennsylvania

Subsurface variation in facies is a main control on reservoir quality and can potentially be related to production. Previous studies of the Marcellus Shale have focused on the regional sequence stratigraphy and depositional models based on outcrops, wireline logs, and subsurface cores. A detailed sedimentological analysis was performed on one complete section of Marcellus core (310 ft) from northeastern Pennsylvania, consisting of core description, petrography (69 thin sections) and high-resolution geochemical analyses (every 2-inch), to better understand depositional processes and conditions and to characterize the vertical heterogeneity of the lithofacies that affect petrophysical and geomechanical rock properties. In addition, pore systems were systematically investigated in these core samples which are at near 3.0%  $R_o$  thermal maturity. Variations in biota, sedimentary structures, bioturbation, organic matter type and content, as well as sizes of pyrite framboids were integrated with geochemical data to define conditions at the sediment-water interface and

within the water column. Fourteen lithofacies were defined on the basis of mineralogy, fabric, texture, and biota. The Marcellus Shale in northeastern Pennsylvania is interpreted to have been deposited in distal, relatively deep areas of the basin. Evidence of weak turbidity currents and bottom-water currents has been observed in the form of graded beds, multiple erosional surfaces, and thin-grain-supported silt laminae. Elevated concentrations of redox-sensitive and productivity-sensitive trace elements (U, Mo, V, Cr, Ni) in the basal shale member suggest deposition under reducing, sulfur-rich (anoxic to euxinic) conditions during times of elevated productivity. An upward decline in organic richness and trace-element abundance was observed, likely due to an increase in dilution and more oxygenated water column through time. The abundance of small conical calcitic shells—including tentaculitids and styliolinids—is significantly higher in the Cherry Valley member. The high abundance of algal cysts (*Tasmanites*)

HGS Northsiders Luncheon continued on page 26



**Figure 1.** Core and thin-section photographs of the massive to faintly laminated argillaceous siliceous mudstone facies in the BMS at the depth of 8099.92 ft. (A) Massive, no apparent lamination on the core surface. (B) Thin section scan of the area inside the white box in A. Lamination is formed by alternating fine-silt laminae and agglutinated-foraminifera-bearing laminae. (C) Agglutinated foraminifer and randomly distributed silt. (D) Agglutinated foraminifer is composed primarily of calcite silts. (E) A collapsed *Tasmanites* cyst and large agglutinate foram with mixed silica and carbonate mineralogy. (F) SEM-EDS map show the matrix texture and mineralogy. qz: quartz; cal: calcite; dol: dolomite; alb: albite.

Save the date!

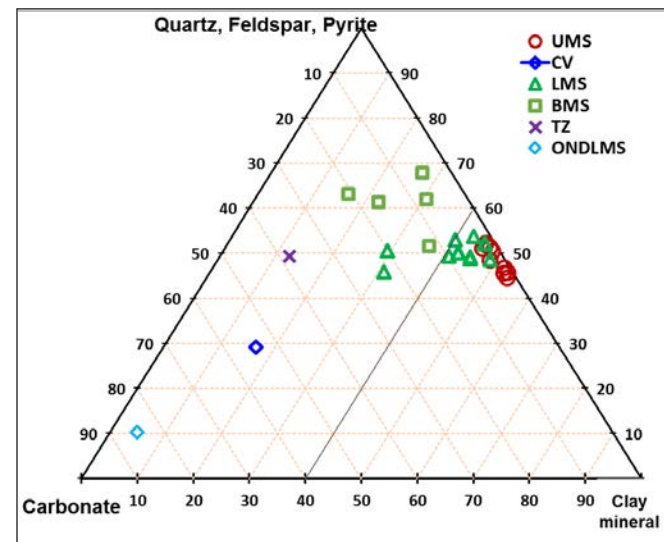
**GSH – HGS  
JOINT SOCIETY DINNER**

Plates to Prospects: Integration of data at multiple scales to enhance exploration, with insights from the deepwater fold and thrust belts offshore Northeastern México

Dr. Carl Watkins  
CGG GeoSolutions

OCTOBER 7<sup>TH</sup>, 2019  
NORRIS CONFERENCE CENTERS  
HOUSTON/CITYCENTRE





**Figure 2.** Ternary plot of mineralogy based on X-ray diffraction (XRD) analysis of the studied Marcellus Formation samples. UMS = Upper Marcellus Shale member; CV = Cherry Valley Limestone member; LMS = Lower Marcellus Shale member; BMS = Base Marcellus Shale member; TZ = Transition Zone; ONDLMS = Onondaga Limestone. Marcellus Formation is mostly siliciclastic mudstone. Upper and Lower Marcellus members are more argillaceous than the Base Marcellus member which is more siliceous.

in the basal Marcellus shale is correlative with the highest sulfur and TOC concentrations, representing an anomalous period of intense phytoplankton growth in the Appalachian Basin caused by additional nutrients, possibly from wind or rivers. The algal cysts bloom increased organic input and enhanced the production of organic matter (OM) (Figure 1). The basal Marcellus Shale (BMS) that is dominated by laminated radiolarian and *Tasmanites*-rich argillaceous siliceous mudstone facies has the best reservoir quality (highest TOC, OM porosity, and lowest clay mineral content).

Both SEM and HIM imaging reveal that OM spongy pores whose sizes are mostly < 200 nm are predominant. Mineral pores are present, many associated with carbonate dissolution. The majority of OM is pyrobitumen which hosts spongy pores. Correlative relationships between total organic carbon (TOC) and porosity ( $R^2=0.5$ ) and TOC and permeability ( $R^2=0.76$ ) suggest that pyrobitumen and OM spongy pores form a connected network. The total porosity does not vary much throughout the Marcellus; however, the measured matrix permeability of the BMS is two orders of magnitude higher than that of the lower Marcellus Shale (LMS) and upper Marcellus Shale (UMS). The significant increase in permeability might be related to higher TOC, more Type II kerogen, and a less-compacted siliceous framework that helps preserve interparticle pores in the BMS than in the argillaceous framework in the LMS/UMS (Figure 2).

**Biographical Sketch**

**Lucy Ko** is a postdoctoral fellow at the University of Texas, Bureau of Economic Geology, specializing in unconventional reservoir characterization and geochemistry. She has been associated with the Mudrock System Research Laboratory (MSRL) for more than 5 years.



She received her MS degree from the Colorado School of Mines in 2011 and her PhD degree from the University of Texas at Austin in 2017. She has worked at Platte River Associates and interned at ConocoPhillips twice in the past.

She is passionate about multidisciplinary science and integration. She enjoys problem-solving, taking challenges, pursuing efficiency, and facilitating cross-discipline communication.

**Wednesday, September 25, 2019**

Petroleum Club of Houston • 1201 Louisiana (Total Building)  
Social Hour 11:15 a.m.  
Luncheon 11:45 a.m.

**Cost: \$35 Preregistered members; \$40 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 General Luncheon Meeting**

**Deborah K. Sacrey**  
Auburn Energy  
dsacrey@auburnenergy.com

**The Application of Multi-Seismic Attribute Classification to Find Hydrocarbons and Estimate Potential Reserves in the Onshore Gulf Coast Basin**

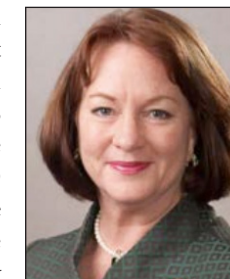
Multi-Seismic attribute analysis is an unsupervised learning process in which clusters of data points are identified by similar properties. This form of Machine Learning not only uses numerous seismic attributes, but in doing so, often reveals details in the data not previously identified by the interpreter. Rather than classifying data based on wavelet information, more discrete lithologic patterns can be defined using sample statistics from the attributes. The result of this sample-based statistical analysis is that one can interpret thin-bed resolution well below conventional wavelet tuning. This, in turn, helps with very accurate reservoir prediction when tying into existing production or in the estimation of new reserve potential in exploration plays.

This presentation will show several case histories taken from interpretive work along the onshore Gulf Coast Basin and the results of the neural analysis of multiple seismic attributes to help find hydrocarbons and determine reservoir extents. The key to using multiple seismic attributes and statistically analyzing them using data points from each sample is that one can now “interpret” depositional information on a much finer scale than ever before and even correlate details in the classified volume to log curves. This is something that interpreters have been trying to do for decades.

**Biographical Sketch**

**Deborah Sacrey** is a geologist/geophysicist with 43 years of oil and gas exploration experience in the Texas and Louisiana Gulf Coast and Mid-Continent areas of the US. She received her degree in Geology from the University of Oklahoma in 1976 and immediately started working for Gulf Oil in their Oklahoma City offices.

She started her own company, Auburn Energy, in 1990 and built her first geophysical workstation using Kingdom software in 1996. She helped SMT/IHS for 18 years in developing and testing the Kingdom Software. She specializes in 2D and 3D interpretation for clients in the US and internationally. For the past nine years she has been part of a team to study and bring the power of multi-attribute neural analysis of seismic data to the geoscience public, guided by Dr. Tom Smith, founder of SMT. She has become an expert in the use of Paradise software and has over five discoveries for clients using multi-attribute neural analysis.



Deborah has been very active in the geological community. She is past national President of SIPES (Society of Independent Professional Earth Scientists), past President of the Division of Professional Affairs of AAPG (American Association of Petroleum Geologists), Past Treasurer of AAPG and Past President of the Houston Geological Society. She is currently the President of the Gulf Coast Association of Geological Societies (GCAGS) and is one of the GCAGS representatives on the AAPG Advisory Council. Deborah is also a DPA Certified Petroleum Geologist #4014 and DPA Certified Petroleum Geophysicist #2. She belongs to AAPG, SIPES, Houston Geological Society, South Texas Geological Society and the Oklahoma City Geological Society (OCGS).

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# September 2019

Sunday

Monday

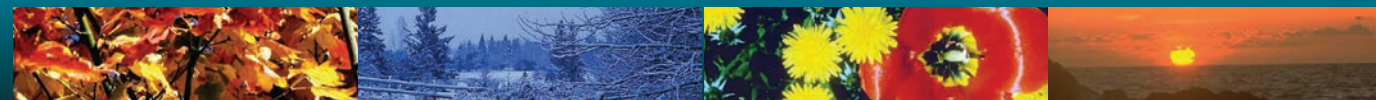
Tuesday

Wednesday

Thursday

Friday

Saturday



# GEOEVENTS



1	2	3	4	5	6 <b>Don't wait, make your reservations online at hgs.org</b>	7
8	9 <b>HGS International Dinner Meeting</b> <i>"Anadarko Petroleum Exploration Lookback 2004-18: Lessons Learned for Conventional Exploration Risk and Uncertainty Predictions" R. Brent Boyd, Page 21</i>	10 <b>HGS Board Meeting</b> 6 p.m.	11 <b>HGS Environmental &amp; Engineering Dinner Meeting</b> <i>"Is There Anything Dangerous Down There? Mitigating the Dangers of Digging, Trenching, and Drilling." Troy Meinen, Page 22</i>	12	13	14
15	16 <b>HGS Joint General and AWG Dinner Meeting</b> <i>"Paleo Overpressure in the Delaware Basin determined from DST, Resistivity and Mud Logs" M. L. Van Der Loop, Page 23</i>	17 <b>HGS Northsiders Luncheon Meeting</b> <i>"Facies, Depositional Environments, Chemostratigraphy, and Reservoir Quality of the Middle Devonian Marcellus Formation, Appalachian Basin, Northeastern Pennsylvania," Lucy T. Ko, Page 25</i>	18	19	20	21
22	23	24	25 <b>HGS General Luncheon Meeting</b> <i>"The Application of Multi-Seismic Attribute Classification to Find Hydrocarbons and Estimate Potential Reserves in the Onshore Gulf Coast Basin" Deborah K. Sacrey, Page 27</i>	26	27	28
29	30			<b>Reservations:</b> The HGS prefers that you make your reservations on-line through the HGS website at <a href="http://www.hgs.org">www.hgs.org</a> . If you have no Internet access, you can e-mail <a href="mailto:office@hgs.org">office@hgs.org</a> , or call the office at 713-463-9476. <b>Reservations for HGS meetings must be made or cancelled by the date shown on the HGS Website calendar, normally that is 24 hours before hand or on the last business day before the event.</b> If you make your reservation on the Website or by email, an email confirmation will be sent to you. If you do not receive a confirmation, check with the <a href="mailto:Webmaster@hgs.org">Webmaster@hgs.org</a> . Once the meals are ordered and name tags and lists are prepared, no more reservations can be added even if they are sent. <b>No-shows will be billed.</b>		<b>Members Pre-registered Prices:</b> Dinner Meetings members..... \$40 Emeritus/Honorary members..... \$40 Student members ..... \$10 Nonmembers & walk-ups ..... \$45 Except - Env. & Eng. .... \$30 Nonmembers & walk-ups ..... \$35 Emeritus/Honorary members..... \$15

**September 5 - 6, 2019**  
AAPG Houston Student Expo 2019  
Houston, Texas, USA

**September 15 - 20, 2019**  
SEG 2019 Annual Meeting  
San Antonio, Texas, USA

**September 30 - October 2, 2019**  
SPE Annual Technical Conference & Exhibition  
Calgary, Alberta, Canada

**October 4 - 5, 2019**  
PS-AAPG West Coast Student Expo 2019  
Bakersfield, California, USA

**October 23 - 25, 2019**  
GCAGS Annual Convention  
GeoGulf19  
Houston, Texas, USA

**November 6-7, 2019**  
HGS Applied Geoscience Conference  
*Applied Geomechanics: Through the Life Cycle of the Field, Spring, Texas, USA, Page 10*

**November 19-20, 2019**  
First HGS/EAGE Conference on Latin America  
*South American Petroleum Plays for Future Decades of the Third Millennium, Houston, Texas, USA Page 16*

**February 11 - 13, 2020**  
AAPG Global Super Basins Leadership Conference  
Sugar Land, Texas, USA


**March 9 - 13, 2020**  
CERAWeek  
Houston, Texas, USA

**May 4 - 7, 2020**  
Offshore Technology Conference  
Houston, Texas, USA

**June 7 - 10, 2020**  
AAPG 2020 Annual Convention & Exhibition  
Houston, Texas, USA

**June 8 - 11, 2020**  
EAGE Annual Conference & Exhibition  
Amsterdam, The Netherlands

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# RENEW YOUR HGS MEMBERSHIP HGS.ORG



# “GeoGulf”: What’s in a Name Change

By Mike Erpenbeck, General Chair, GeoGulf 19 Houston



The old GCAGS Convention has been rebranded as GeoGulf. The word has been out for some time now. People know about the rebrand. Many others will learn about it as we ramp up the publicity campaign in the next couple months, the final two months before it hits town on October 23-25. Many younger geoscientists never quite knew what the old designation was all about. “GCAGS-GCSSEPM Convention”? – “Acronyms-R-Us”... It might as well be alphabet soup of some kind. What do the insiders know that we don’t?

The new branding gives us the opportunity to shout it out: **GeoGulf remains the annual convention of all local geological societies comprising the Gulf Coast Association of Geological Societies, whose members work and play in the rocks of the Gulf Coast geological province.** This is my paraphrase of the many promotional “planks” provided to us by the pricey **image/branding consulting firm** we employed to guide us in rebranding this event.

### The Old Event

The “old” GCAGS convention has been held annually for 68 years. It has been a popular annual event, unique in its focus on the Gulf of Mexico area oil and gas industry. Each year it was kicked off by a high energy **Icebreaker** that was designed to get the crowd geared up for a full immersion into two days of Gulf geology. The technical session consisted of up to 100 technical papers **orally presented**, mostly from those geoscientists and professors who were most familiar with onshore and offshore Gulf oil and gas exploration. They were published in the GCAGS *Transactions*, which every year found their way to the bookshelves of nearly every company library. There was a trade show associated with it, **exhibitors** promoted their services and demonstrated cutting edge technology. **Sponsors** demonstrated their commitment to the industry throughout all years of the commodity price cycle by their donations and were amply rewarded by the promotional on-site exhibits and the advertising we provided them. For about 10 years Gulf Coast Section of **SEPM** was a joint partner in the Convention. **Short courses, field trips...** All these items were hallmarks of the GCAGS convention. **All these items have been retained in the new annual GeoGulf.**

Make no mistake. GCAGS, *the organization*, still exists and is relevant as it has ever been over its 70-year history. Going forward, the annual GCAGS convention, *the event*, will be known as GeoGulf.

### The New Event

While retaining the core, traditional elements of the historical Convention, the rebranding initiative recognized that substantial “tweaking” would be imperative to address rapidly developing new technologies, new demographics, and new business cultures.

As a commitment to the interests and concerns of early career geoscientists who are at the tip of the spear of these changes, those of us planning GeoGulf 2019 Houston have responded accordingly.

Look for an expansion of short courses and session themes to include some that are, strictly speaking, not Gulf of Mexico focused, such as **data analytics, machine learning, multivariate statistics, geologic creativity, reservoir fluids behavior**, etc. The Environmental Geology sessions are a must for geologists involved in water resources and protection.

We are currently in the process of filling out a slate of panel speakers and discussion coordinator who will address issues on the **business and economic** aspects of geological exploration with implications for career path choices, and another panel for skills and creativity in **career management**.

The evening dinner and entertainment will be tailored to appeal to younger professionals in a networking and socializing atmosphere.

We are planning a student symposium in which students meet with industry professionals and managers in round table discussion groups to learn day-to-day activities in large and small firms, networking, and job search.

A unique exhibit of the sands and conglomerates deposited near downtown Houston by flooding from Hurricane Harvey in August 2007 will be the focal point of the exhibit floor. Guided information of the depositional process will be posted alongside each exhibit. These plastic impregnated sand panels are of museum quality and provide an aesthetic dimension to the Convention.

GeoGulf 2019 Houston will be held on October 23-25 at the Marriott Westchase, 2900 Briarpark Dr., Houston. The suburban setting ensures we will avoid the traffic and parking problems at a downtown convention and hotel venue. A significant benefit: parking is freely available and free!

GeoGulf tackles all the most pressing topics facing the field—from oil, shale and natural gas to Big Data and business strategies—GeoGulf is an indispensable source of education, practice and professional development. Here, you’ll share ideas with fellow thought leaders, delve into the depths of scientific discovery, explore new and emerging research and walk away with the collective knowledge of colleagues and exhibiting companies all committed to advancing the field of geology in the Gulf Coast region. Expand your mind, enhance your career, advance your field—all at GeoGulf 2019 Houston. Check it all out and register at [www.2019.gcagshouston.com](http://www.2019.gcagshouston.com). ■



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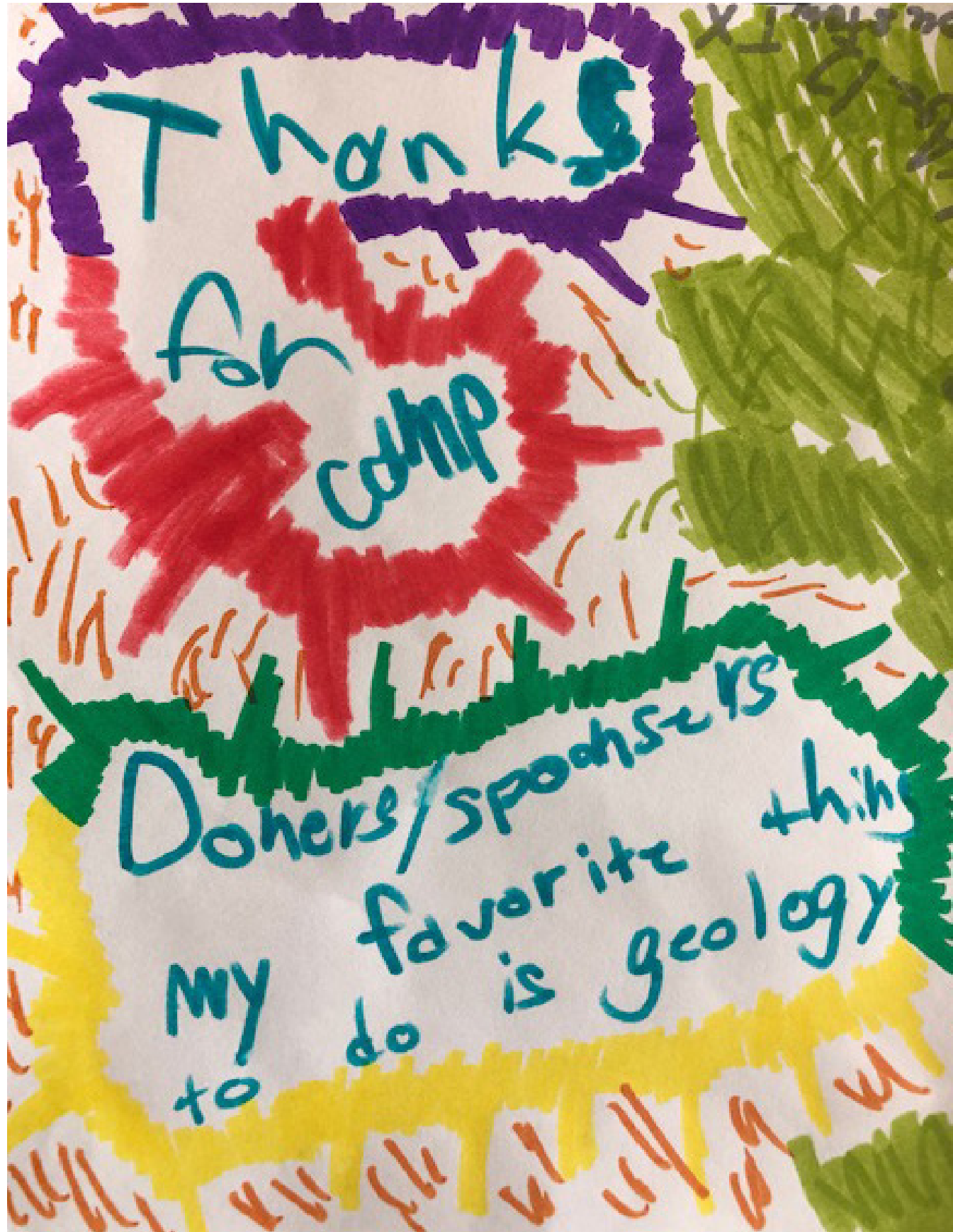
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## Thanks from a Camp Cullen Camper



## Review of the 2019 HGS Outcrop Family Campout

By Lanette Marcha

**EDITOR'S NOTE:** Our 2019 YMCA Camp Cullen Outcrop Family Campout event, which occurred in Trinity, Texas on Lake Livingston on April 12 – 14, 2019, turned out to be another success. Following is some vivid description of a family experience provided by Lanette Marcha. In addition, HGS past president John Adamick and other HGS members have participated in Volunteer Days at the camp to help develop the camp's geologic activities. He recently received a lovely "Thank You" card from one of the young campers who participated in geologic activities at camp. Camp Cullen has a strong geoscience curriculum for kids (in addition to traditional camp activities). Thanks to many HGS volunteers who have made this event possible. The next HGS Outcrop Family Campout at the YMCA's Camp Cullen will be held on April 17-19, 2020. Please mark your calendar, bring you family and friends and have fun together. For how to register for the events, please contact the office staff of Houston Geological Society.

Rain or sunshine, YMCA Camp Cullen has provided my kids and me long-lasting memories of safe fun out in nature. We have attended two to three events that HGS hosted there, thanks to Shannon Lemke, and plan to continue participating. The camp has helpful staff, clean spacious cabins and bathrooms with comfortable beds, and several activities to capture the attention of kids from all age groups, including adults. Buffet style meals (far from five stars, but good enough) are provided. You must bring your own bedding, towels, and toiletries. Out at the cabins, cellular coverage is limited, but the main hall has free wireless and cellular coverage. Activities that my kids have waited for all year long include a great zip line, GaGa Ball, riflery, archery, canoeing, and the quarry (where they get to find in situ fossils). Other activities kids have enjoyed are the pipeline sledding, the geologic lab, a huge tower they climb up harnessed, playing basketball, walking, or sitting and admiring the beautiful lake, making smores around a campfire, and simply getting to know the counselors and new friends.

The commute is a short drive from Houston (about 1.5 hours), just north of Trinity and easily manageable. It is a serene escape into nature where kids and adults make new friends, bond, exercise (loads of walking/hiking), and have fun with very minimal preparation. You can take bikes and scooters and enjoy the trails. I have invited friends who are not part of HGS to share in the fun and get a break from everyday city life, and they too have enjoyed it.

Thus, I certainly hope more HGS families and friends will join, so that HGS can have the camp to themselves and receive more individualized attention, stand in shorter lines, have more networking opportunities, and simply easily get away to enjoy nature with family and friends in a safe and well-organized manner. ■

The next HGS Outcrop Family Campout at the YMCA's Camp Cullen will be held April 17-19, 2020



Author Lanette Marcha and her children



Game time during the rain delay



Learning to shoot at the riflery range



Camper Brad Hamilton on the Alpine Tower



The YMCA's new jump pillow



# Houston Geological Society President's Night Award Dinner 2019

### Corporate Star Awards

Anadarko Petroleum Corporation - Platinum

Baker Hughes, a GE Company – Gold

Chevron– Gold

Core Labs– Gold

TGS– Gold

INTESCA, America and Advisian Worley Parsons Group – Gold

Haliburton – Silver

IHS Markit – Silver

SM Energy – Silver

Schlumberger – Bronze

Terra Guidance – Bronze

### Rising Star Awards

Jeremy Andrews

Casey Langdon

Bryan Flynn

Rebecca Morgan

David Orchard

Mark Herkommer

Ceri Davies

Lauren Robinson

Jason Simmons

Marcus Zinecker

### Chairman's Awards

Steven Johansen

Kenneth Thies

Bob Wiener

### Distinguished Service Awards

Matthew Cowan

Bill Dupré

Walter Light, Jr.

Letha Slagle

Sue Pritchett

Henry Wise

### Honorary Life Membership Awards

Richard Howe

Inda Immega

Neal Immega

Glenn Lowenstein

Robert Traylor

John Tubb, Jr.

### Teacher of the Year

Jessica Snyder

### Gerald A. Cooley Award

Kenneth Nemeth

### Recognition of Departing Board

Cheryl Desforges, President

Penny Patterson, Vice President

April Parsons, Secretary

Tarek Ghazi, Treasurer

Jim Tucker, Editor

Greg Halvatzis, Director

Steven Shirley, Director

### Passing of the Rock Hammer

Jon Blickwede

### Recognition of Incoming 2019-2020 Board Members

Jon Blickwede, President

Jim Tucker, President-Elect

Scott Sechrist, Vice President

Tami Shannon, Secretary

Annie Walker, Treasurer

Thomas Reed, Treasurer-Elect

Fang Lin, Editor

Ceri Davies, Editor-Elect

Wayne Camp, Director 1

Brent Boyd, Director 2

Rachel Todkill, Director 3

Bob Fryklund, Director 4





# Guest Night 2019: A Night at the Museum and A Walk in Tar Pits for Ice-Age Bones in Venezuela

By David M. Orchard

The Houston Geological Society held its annual Guest Night on Saturday evening, June 8, 2019 in the Houston Museum of Natural Science. The evening included two seatings for *Tales of a Time Traveler* in the Burke Baker Planetarium; dinner in the Morian Hall of Paleontology; a highly interesting presentation on fossil hunting in western Venezuela by John M. Moody, now an educator at Grayson College in Dennison, Texas; and a showing of the documentary, *Apollo: The First Steps* in the Giant Screen Theater.

The presentation by John Moody (accompanied at the event by his Venezuelan wife, Belkis, and their daughter, Marianne) told a classic scientific adventure tale. He titled the talk “Los Fósiles de las Menes de Venezuela: An Extraordinary Paleontological Quest to Discover Ice Age Fossils in Tar Pits of Venezuela.” Moody worked as a petroleum geologist in the city of Maracaibo, Venezuela, during the 1990’s and early 2000’s. Despite continuing contract work as a geologist, he found time to act as Curator of the Paleontology Section of the Museo de Biología of La Universidad del Zulia, a position that he held for eleven years.

During those years, he led a handful of students on unfunded expeditions in search of fossil localities throughout western Venezuela, including the regions around Lake Maracaibo and the Perija Range of the Andes. One highly memorable outing was to Cueva de los Huesos (Bone Cave) high in the Perija Range and very close to the Venezuelan-Colombian border, where they found bones of an extinct, cave-dwelling giant ground sloth. That outing was replete with physical and political danger. John and his team travelled to the site in a military helicopter complete with manned machine guns.

The group’s other outings led to an impressive list of finds: Devonian trilobites, lycopod plants, and armored fish; Jurassic herbivorous and carnivorous dinosaur fossils; the first Venezuelan ichthyosaur and pterosaur; and three-dimensional fossil fish and a sea turtle from the Cretaceous.

After introducing himself to a researcher from the La Brea Tar Pits in Los Angeles, John began investigating numerous large tar seeps (menes) in the Maracaibo and Perija region. Following several trips to document the locations of potential excavations, he and his protégé, Ascanio Rincon, discovered a site at Mene de Inciarte

in the foothills of the Perija range. A small excavation yielded many hundreds of bones, including, to mention a few, those of sabre-toothed cats, dire wolves, foxes, ground sloths, camels, horses, armadillos, rodents, birds, bats, rabbits, and snakes.

That discovery proved the potential for scientific, educational, and employment benefits from digs in similar sites extending across northern Venezuela. With a goal of organizing and funding a major program of excavation, identification, and display of these fossils, the Foundation for Vertebrate Paleontology of Venezuela formed in cooperation with Venezuelan ministries, the national oil company (PDVSA), and universities. The foundation created a blue print for the future work but, unfortunately, the political conditions in Venezuela made it impossible for the foundation to carry out its program. It disbanded, and the fossils remain for future work by future paleontologists.

The Guest Night Committee for 2019 consisted of David M. Orchard – chair, Mark Trees, Sue Pritchett, Mike Erpenbeck, Sharma Dronamaju, and Casey Langdon. Their work was supported by the staff at the HGS office, Andrea Peoples and Jacky Jordan. Sponsors were Thunder Exploration, Petrophysical Solutions, GeoMark, Shell, Schlumberger, ConocoPhillips, Concho Resources, Equinor, and Star Creek Energy. ■

## Thanks to our Sponsors

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## Letter to the Editor continued from page 7

The Export Ban has a deadline of the 15th of October. It has been confirmed with the UK tax authority that a Private Treaty Sale for the notebook collection has been agreed; this allows for the tax to be removed from the sale to reduce the purchase price from £1,444,000 to £966,000.


Together with the University’s own contribution and on-line and off-line pledges, the amount raised currently stands at **£668,000** – the amount still needed is **£298,000** (as of 8/14/19). Promotion of the campaign by other organizations and individuals has helped drive the momentum. The AAPG History of Petroleum Geology group, the History of Geology Group of the Geological Society of London, and History & Philosophy of Geology Division of GSA are just some of the organizations that have helped spread the word about the donation plea. Information about the project is on the website: [www.ed.ac.uk/save-lyell-notebooks](http://www.ed.ac.uk/save-lyell-notebooks).

To quote from the website about the University of Edinburgh’s plan: “The University’s acquisition of Charles Lyell’s notebooks would provide an outstanding opportunity to make them fully and freely accessible for the first time. Through conservation and digitisation we would be able to share the collection online and to make it available for collaborative and creative working.”

If you are interested in pledging a donation, please go to <https://www.ed.ac.uk/giving/save-lyell-notebooks/pledge-to-save/>; the amount will be collected when the total amount is reached. Large donations are great, but many smaller donations will definitely help. ■

– Submitted by Janet Combes, [jmcombes@msn.com](mailto:jmcombes@msn.com)

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# 2019 HGS Skeet Shoot

By Mike Jendral, HGS Skeet Shoot Committee Chairman and Andrea Peoples,

The 2019 Skeet Shoot was held on Saturday, June 8th at Greater Houston Gun Club in Missouri City. Despite the heat, 65 shooters turned out to support HGS and the shoot. Here are the results:

- HOA CHAMP** TJ Bayer
- HOA RU** Tom McCarroll
- LADY CHAMP** Maime Witt
- LADY RU** Andrea Peoples
- JUNIOR CHAMP** Eddy Haizlip
- AA CHAMP** Michael Brannan
- AA - RU** James Blattman
- A CHAMP** Detrich Landis
- A - RU** David Perez
- B CHAMP** Glenn Pangilinan
- B - RU** Atif Hariz
- C CHAMP** Jeremy Keeler
- C - RU** Russ Andress

**Winner of the Red Rider BB Gun** – Mallory Peoples (age 17)

Depressed financial times in the industry made finding sponsorship a challenge this year, but we have some true-blue friends of HGS and the Skeet Shoot that made sure we had the support we needed

for the success of the event: Nabors Drilling Solutions, PetroMar a Nabors Company, Petrophysical Solutions, Inc., Seisware and Merrick Mainster of Apache once again provided cold beer once the shooting was over to wash down the excellent barbecue lunch from Charlie's BBQ. Thanks to all of you for supporting the shoot!

The success of this event would not have been possible with the tireless efforts of Andrea Peoples and Jacky Jordan at HGS, as well as the professionalism of Kevin Dougherty and his staff at Greater Houston Gun Club. ■



# HGS Welcomes New Members

## New Members Effective June 2019

### ACTIVE MEMBERS

- Darwin (Trey) Boardman
- Ellie Chuparova
- Jeff Davis
- Stephen Hubbard
- Sheryl Liaw
- Laura Murray
- Cesar Vaesa

### ASSOCIATE MEMBER

- Paul Laker

### EMERITUS MEMBERS

- Randall Barta
- Charles Buzby
- James Sorrells

### STUDENT MEMBERS

- Alero Botosan Atigbin
- Connor Matherne
- Syed Moosavi
- Jake Sleight

## New Members Effective July 2019

### ACTIVE MEMBERS

- Curtis Bixler
- Maria Bolivar
- Danielle Cavender
- Peter Clift
- Mark Gallagher
- Jessica Giles-Boardman
- Helen Hodges
- Jeremy Keeler
- Kriby Mackey
- Zach McDonald
- Kurang Mehta
- Chase Meinert
- Richard Parker
- Waymon Pitchford
- Poorna Srinivason
- Gary Steffens
- Nana Xue
- Fuge Zou

### ACTIVE MEMBERS

- Michael Hoffman
- Ben Hicks
- Thomas Jones
- Robert Killian
- Robert Klimentidis
- James Lance
- Robert Lee
- Gene Litke
- Jake Marshall
- James Mikesh
- Paul Post
- J. David Reeves
- Rick Richardson
- Victor Schmidt
- Anthony Skeryanc
- Donald Van
- Nieuwenhuise
- Michael Wisda
- Bruce Wright
- Jose Miguel Yilays

### ACTIVE MEMBERS

- Juan Camilo Diaz
- Carreno
- Danelle Carr
- Nicolas Castillo
- Weston Charles
- Laura Dafov
- Joao Victor G de Morais
- Nick Ferry
- Angie Garcia
- Sean Gu
- Adam Jones
- Andrew Layden
- Jetson Le
- Jeffrey Lee
- Jiaxuan Li
- Crystal Luna
- Juan Felipe Celis
- Mantilla
- Erin McCullough
- Bhaura Merchant
- Omar Hossan Moghazy
- Jabeen Momin
- Christian Montes
- Bryan Moore

### ACTIVE MEMBERS

- Chris Myers
- Claire Ong
- Johnathon Osmond
- Andrea Paris
- Charlotte Priddy
- Sonia Quintero
- Kamil Ahmed Qureshi
- Ramyn Ravindranathan
- Amy Regis
- Regan Robinson
- Trevon Russell
- Robert Rutz
- Yuan Tian
- Joao Gabriel Topan
- Luis Vazquez
- Ana Vielma
- Olivia Wren
- Huzaifa Zaman
- Bingyi Zhao

### EMERITUS MEMBERS

- Ronald Charpentier
- Marilyn Cisar
- Michael Fein

### STUDENT MEMBERS

- Robert Bean
- Stefan Boise

## New Members Effective August 2019

### ACTIVE MEMBERS

- Joshua Krnavek
- Jessica Palmer
- Barton Wilson

### EMERITUS MEMBERS

- Helen Farrell
- Thomas Fett
- Andrew Harper
- Victor Jones III
- John Layman
- Susan Owens
- Alan Schwartzbard
- Steven Tobias

### STUDENT MEMBER

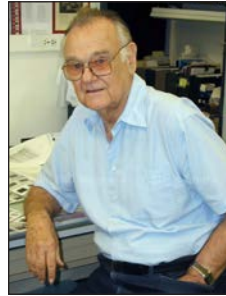
- Katherine Garcia

*Welcome New Members*



## Remembrance

ALBERT BALLY  
APRIL 21, 1925- JULY 30, 2019



**ALBERT (BERT) WALTER BALLY** died peacefully after a short illness at The Gardens of Bellaire in Houston, TX on Tuesday, July 30, 2019, at the age of 94.

He was an internationally known geologist/geophysicist who traveled the entire world. After a distinguished career with Shell Oil, he became the Chairman of the Department of Geology and Geophysics at Rice University, in Houston, Texas. He worked on various national and international projects until a few weeks before he passed away. ■

## Remembrance

EDWARD FABRA HAYE  
APRIL 22, 1929 - AUGUST 13, 2019



**Edward Fabra Hays** died on Tuesday, the 13th of August 2019, from a fall doing what he loved to do - powerwalking in his neighborhood. He attended McKinley Grade School and Mark Twain Junior High, Central Catholic and Alamo Heights high schools in San Antonio, Texas. He briefly enrolled at Trinity University and then transferred to University of Texas in Austin. He graduated in 1951 with a BS degree in Geology.

He went to work for Standard Oil of Texas, now Chevron in 1951. He started his own gravity meter company, Photogravity, in 1959. Ed sold Photogravity in 1977 and started Benchmark Exploration, Inc. where he developed and sold oil and gas prospects to the oil industry. Ed joined Houston Geological Society in 1960.

Edward is survived by his wife Janice, two daughters, a son and five grandchildren. ■

- This Remembrance was summarized from the Life Tributes section of the *Houston Chronicle* dated August 16, 2019

## Remembrance

GARY BIESIADECKI

**GARY BIESIADECKI**, 64, passed away at his home in La Marque, Texas, back in June. Gary was a geologist at Lime Rock Resources and a member of HGS from 1996-2015. ■

## Remembrance

JOHN LESTER ELLIOTT  
1928-2019



**JOHN LESTER ELLIOTT** was born on July 2, 1928 in Los Angeles, California. He is survived by his wife of 51 years, Jennifer 'Jenni' Clough Elliott of Houston; son Peter John Clough Elliott; daughter Clare Suzanne Elliott and three grandchildren. John earned a Bachelor's and a Master's Degree in Geology from the University of California, Los Angeles. John spent his childhood in California sunshine, growing up in the Los Angeles neighborhood of Glendale. Summers were spent camping with his parents, sister, aunts, uncles, and cousins in the Sierra Nevada Mountains. As a teenager during World War II, he volunteered as a firefighter in those same mountains (fortunately, there were no major fires those years). A veteran of the Korean War, John served his country as an intelligence officer in the Navy. He circled the globe twice aboard the aircraft carriers Lake Champlain and Hornet.

His career in petroleum exploration took him around the world, to Europe, Africa, South America, the Middle East and Australia. As all geologists eventually do, John moved to Houston with his family in 1975. John worked as a petroleum geologist, heading the Association of International Petroleum Negotiators from 1988 to 1989. John and the teams that he worked with were responsible for finding four billion barrels of oil in the Bass Strait off the coast of Australia and made major discoveries in offshore Guyana that have yet to be fully developed. John joined HGS in 1975.

When he was not working, John spent his time cooking, playing tennis, gardening, hunting duck, attending opera, and viewing art. He enjoyed a game of chance preferring gin rummy and, later, dominoes, and he always kept score. On Sunday one could reliably find John reading the newspaper while dividing his attention between it, a football game (muted), and an opera playing at volume over the stereo. A true bon vivant, John loved to entertain in his home, which is filled with many beautiful objects he collected abroad. ■

- Summarized from the Life Tributes section published in *Houston Chronicle* on July 23, 2019

## Remembrance

WILLIAM "BILL" ALEXANDER RUTHERFORD  
1947-2019

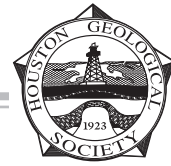


**William Alexander Rutherford**, also known as Bill Rutherford, age 72 of Spring, Texas, has died on Saturday, July 20, 2019 at his home due to complications of surgery. Bill was born in Bryn Mawr, Pennsylvania. He was the husband of late Margaret "Nancy" Rutherford, with whom he shared 36 years of marriage. He is survived by two sons, one daughter and seven grandchildren.

Bill had an undergraduate degree from Plattsburgh University in 1969, and a Masters in geology from Rensselaer Polytechnic Institute in 1974. Bill joined HGS in 1984. ■

- This Remembrance was summarized from the Life Tributes section of the *Houston Chronicle* dated July 29, 2019





**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.

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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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8	\$750	\$1,250	\$2,250	\$4,300						
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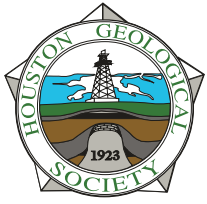
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