



# The Record

Denver Geophysical Society

Volume 47 Number 3 August 2022

## Election Issue

### Upcoming Events

IMAGE '22—August 28—September 2  
Houston, TX

September Luncheon—September 8 @  
12:00pm

October Luncheon—October 13 @ 12:00pm

DGS Elections—September 15—October 1

November Luncheon—November 10 @ 12:00  
pm

Holiday Party—December 8

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# ELECTIONS

## Candidates for the 2023 Executive Board

**Voting is from September 15 through October 1.**

**Look for an email to vote on September 15.**

### **Candidate for Vice President-President Elect**

#### **Travis Pitcher**

##### Professional Experience

Impact Exploration & Production (2018-Present)  
Noble Energy (2015-2018)  
UNAVCO (2012-2013)  
USGS (2009-2012)

##### Education

MSc Geophysics (2015), Colorado School of Mines  
BSc Geophysical Engineering (2012), Colorado School of Mines

##### Professional Affiliations

SEG, AAPG, DGS, RMAG

As candidate for Vice President-President Elect, I look forward to supporting DGS and bringing strong technical content to the monthly luncheons. I have been a member of DGS for 8 years and have presented at both luncheons and the 3DSS. DGS is such a valuable resource to the geophysical community in Denver, from students to seasoned geoscientists, and I hope to keep the membership base active and engaged in everything it has to offer. There are exciting advancements happening through geophysics in all industries – I think we have a bright future as geoscientists. Thank you for your consideration.

### **Candidate for Treasurer**

#### **Jess Vahling**

##### Professional Experience:

Occidental Petroleum (2019-present)  
Anadarko Petroleum (2014-2019)  
Hess Corporation (2009-2014)

##### Education:

BS Geology, Kansas State University, 2006  
MS Geology, Wichita State University, 2009  
Professional MS Program Geophysics, University of Houston, 2011

##### Professional Affiliations:

DGS, SEG, APPG, RMAG

Since I moved to Denver 7 years ago, the DGS has provided me many opportunities for learning and networking. I am very much looking forward to giving back to this valuable community through a position as Treasurer on the executive committee. I hope to be able to help continue to build a strong and successful society.

*Elections continued on page 3*

## **Candidates for Secretary**

### **1—Andrew Keene**

#### Professional Experience:

Geophysicist, SM Energy Company (2019-)

#### Education:

Master of Science, University of Montana (2017-2019)

Bachelor of Arts, Carleton College (2013-2017)

#### Professional Affiliations:

Denver Geophysical Society, Rocky Mountain Association of Geologists, Society of Exploration Geophysicists, American Association of Petroleum Geologists

I strive to be more involved within the geophysical community of Denver and would like to help bring more folks together across experience levels. I love attending DGS luncheons and meeting other members of the society and want to encourage more folks to join for professional and personal growth.

### **2—Xan Davidson**

#### Professional Experience:

Telemark Energy Services (2020-current)

WesternGeco (2001-2009)

Geco-Prakla (2000-2001)

#### Education:

GIS Certification, University of Colorado, Denver (2022)

M.S. Geophysics, Purdue University (2000)

B.S. Solid Earth Sciences, Purdue University (1996)

#### Professional Affiliations:

DGS

I stepped away from the professional environment to focus on raising my two children. During that time, I volunteered heavily in the schools and served on several PTA boards as fundraising chair, school supply chair, newsletter editor and most recently, treasurer. Now that my children are older, I'm looking to return to work, and I am currently pursuing a GIS certificate.

## **Candidate for Editor**

### **Melinda Gale**

#### Professional Experience

Colorado School of Mines, Program Manager, Reservoir Characterization Project (2021-Present)

Tom Brown, Inc., Senior Exploration Geophysicist (1996-2004)

ARCO/ Vastar Resources (1988-1996)

#### Education

BS Geophysical Engineering (1988), Colorado School of Mines

#### Professional Affiliations

SEG, AAPG, DGS

As candidate for Editor, I hope to continue building a strong communications platform for the DGS community. I would like to be more actively involved in the geophysical community in the Denver area, and this position would allow me valuable opportunities to contribute consistently to DGS' programs. Additionally, my position within the Department of Geophysics at Colorado School of Mines provides a unique opportunity to encourage more active engagement from student organizations and young professionals in DGS programs and activities. Thank you for your consideration.



## The International Meeting for Applied Geoscience and Energy

28 August–1 September 2022

George R. Brown Convention Center  
Houston, Texas



# Join me at IMAGE '22!



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**PAST PAST PRESIDENT - ANGIE SOUTHCOTT**

### COMMITTEES

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denvergeo.org/advertising-in-the-record/

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#### Information for Contributors

Your editorial contributions are encouraged, particularly about classes, seminars, personnel news, company news, or other items of interest to the geophysical community. All suggestions and manuscripts should be emailed to DGS at office@denvergeo.org. Targeted deadline for submissions is the first of the publication month (February, May, August, November) but exceptions can be made with the editor's approval. We reserve the right to edit all material according to standard practices.

Opinions expressed within are solely those of the authors. They are not to be interpreted as those of the DGS.



# Executive Corner

By Mark Davidson  
Telemark Energy Services  
2022 DGS President

I wanted to talk a bit about the society and where we have been trying to get to. During my tenure as President, we've worked to improve the communications and information provided by the society for the benefit of the members. To do this, we've worked hard to bring quality talks to the Luncheons, support a robust 3DSS, provide a Machine Learning workshop (in development), and provide quality content for The Record. We are also actively making some "behind the scenes" improvements, such as upgrading our web service and email to improve our communications reliability.

As you're no doubt aware, this takes time and effort. As DGS is an all-volunteer organization, this means we, the committee and our volunteers, are taking our time to build and offer these opportunities for the membership. We continue to work diligently to find sponsorship, technical content, and volunteers for the very things our membership has indicated hold high value to them.

Through our various efforts to obtain feedback, we've fielded a variety of comments and recommendations from our membership, many which we have implemented with varying degrees of success. Unfortunately, our requests for contributions haven't translated to the outpouring of resources I had hoped. Naively, I suppose, I expected an "if you request it, they will come" type situation with technical articles, student profiles, and other materials pouring in faster than we could process them. This hasn't been the case, and I can proffer a number of plausible reasons, but the reality is we need to continue to leverage our membership to aid in our efforts.

So, I'll cut to the point. The DGS is an organization for the benefit of its members. However, we need our members to contribute to be able to provide those benefits. It's a bit of a circle...but the short answer is we need your help and input with contributions: whether it's money, time, content, or experience. We need to continue to bring young scientists into our organization. We need to all step up and continue providing the information and opportunities the DGS has been known to provide for the past decades.

Thanks for letting me bend your ear, and I hope this encourages you to contribute for the benefit of the organization.



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# WE MOVED!

Denver Geophysical Society has moved  
their mailing address.

Our new address is:

730 17th Ste B-1  
Denver, CO 80202

## Keep it Professional

Do you have news you would like to share with the community? A job change or a new promotion? Anything that's industry/job related, we would love to share your news. We aren't necessarily looking to share that Bob is now a grandfather but we would love to celebrate your accomplishments. Send 2-3 sentences with your name and what your news is and we'll add it to the next newsletter. For consistency, DGS reserves the right to edit and limit what gets published. So, if you really want your news shared, remember to "Keep it Professional."

# Events

## 2022 DGS Golf Tournament

Thursday July 21<sup>st</sup> marked the return of the annual golf tournament, hosted by The Ridge at Castle Pines! We had ideal weather for the 18-team shootout. With some tough competition for the top spot, the overall winners were the squad comprised of past DGS President Nick Grenfell, Paul Differding, Tim Michel and Erick Erwin. Thank you to all who sponsored, participated, and volunteered for this year's event. We look forward to seeing everyone at the event next year.

## Rockies Game

Based on the success of our first 2022 DGS Rockies Game, we're hosting a second game on Thursday, September 22, 2022 at 1:10PM. Tickets will be purchased in a block once final counts are made. For members, tickets will cost \$10 and non-members, \$20. Last time we had members from SM, Halliburton, Ikon, and more in attendance... don't miss your chance to network and enjoy a fall baseball game with your peers!"

RSVP to the DGS email - more details to come

Denver Geophysical Society  
Machine Learning / Artificial  
Intelligence Workshop  
Request for Abstracts



Oct 20<sup>th</sup>, 2022

Denver Earth Resource Library

730 17<sup>th</sup> St B-1 (Equitable Building), Denver, CO 80202

Abstracts limited to two pages text and figures

Submit abstracts to [abstracts@denvergeo.org](mailto:abstracts@denvergeo.org)

Abstracts due Sept 28th



# Monthly Luncheon Talks

Thank you to everyone who has given a talk or is signed up to give one.

September's Talk:

## **RESERVOIR QUALITY AND WELL PERFORMANCE ANALYSIS IN THE MIDDLE MEMBER OF THE LEWIS SHALE, GREATER GREEN RIVER BASIN, WYOMING.**

Carolina Mayorga-Gonzalez

Abstract:

The Lewis Shale is a turbidite system encompassing sandstones, siltstones, and organic-rich shales deposited during the last Cretaceous seaway transgression. Its lithological characteristics vary depending upon its location within the Lewis Shale depositional basin (eastern Greater Green River Basin). This basin is a large oil and gas producer in the United States, and it is expected to increase in the upcoming years. As a result, drilling operations in the area can significantly affect the wildlife by impacting their habitat and reproduction areas.

The main concerns of log analyses in tight sandstone reservoirs are porosity estimation, accurate water saturation calculation, permeability determination, and understanding how clay affects log responses. In addition, petrographic thin section, routine, and special core analyses are necessary to develop a reliable petrophysical model. Several authors have mentioned some of the petrophysical properties of the Lewis Shale. However, there are no petrophysical models in the sandstone intervals tying together log and core data to the author's knowledge. Completion techniques are often one of the most expensive parts of drilling and producing a well. Therefore, the costs of proppant and completion fluid are significant in determining individual well or even field economic viability. To identify which one was affecting the production the most, the production analysis was made using the volume of proppant, the volume of fluid injected, the number of fracture stimulation stages, and production to infer their effect on production. But it seems there is no correlation between them.

The objective of this work is to develop a high-resolution reservoir characterization. This analysis is crucial for understanding this play and decreasing uncertainty when planning new well placements. This formation is considered an unconventional reservoir due to its low porosity and permeability and the need to use hydraulic fracturing to obtain hydrocarbons at commercial rates. In addition, this area around the cores is relatively undeveloped for horizontal wells. The petrophysical characteristics of these four core displayed the same level of heterogeneity as the facies described. Samples have high variation in water saturation values and, in general, very low porosity and permeability, characteristics of these reservoirs.

Ligia Carolina Mayorga-Gonzalez is a PhD from Colorado school of Mines. She obtained her degree in May 2022. She obtained her undergraduate degree in geology at the Universidad Nacional de Colombia in Bogota. She then pursued a master's degree at the University of Oklahoma. She worked for two years as a reservoir geologist at MorningStar Partners focusing on the Lewis Shale formation in Wyoming.

# Monthly Luncheon Talks cont

October's Talk:

## **COMPLEX HYDRAULIC FRACTURE PROPAGATION BEHAVIOR REVEALED BY CROSS-WELL STRAIN MEASUREMENT**

Dr. Ge Jin

Abstract:

Understanding the propagation of hydraulic fractures is critical for low porosity, low permeability unconventional reservoir development. In this study, we use cross-well strain measurement based low-frequency distributed acoustic sensing (LF-DAS) to monitor the hydraulic fracturing operations in the Chalk Bluff field in the Denver-Julesburg (DJ) Basin, Colorado. The interpretations of fracture-hit signals at monitor wells yield insights into the fracture geometry and propagation across and within two targeted formations: Niobrara and Codell. We observe significant differences in hydraulic fracture propagation between the two formations; the half length of hydraulic fractures in the Codell formation is much longer than that in the Niobrara. In addition, hydraulic fracture propagates significantly faster in Codell than in Niobrara under the same pumping rate. The differences could be explained by higher natural fracture density and potentially lower stress anisotropy in the Niobrara formation. We also observed different fracture orientations between the two formations and inconsistent fracture orientations within Niobrara. Hydraulic fractures observed in Codell orient at 100 degrees consistently, while two groups of hydraulic fracture azimuths (110 and 240 degrees) can be observed in Niobrara. The difference in fracture orientations in Niobrara and Codell indicates stress regime changes between the formations. The inconsistency of fracture azimuth within Niobrara may be caused by the zipper fracturing sequence. Strong cross-formation fracture connections between the two formations can also be observed, with LF-DAS signal signatures indicating high fracture connectivity between wells. Later analysis of production data indicates substantial cross-formation interference, which is consistent with cross-well strain interpretations. These observations help us better understand the complex fracture behavior in the DJ Basin and provide critical constraints on optimizing the unconventional reservoir development, including well spacing and completion designs.

Dr. Ge Jin is Assistant Professor of Geophysics and co-director of Reservoir Characterization Project ([rcp.mines.edu](http://rcp.mines.edu)) at Colorado School of Mines. His research mainly focuses on Distributed Fiber-Optic Sensing (DFOS) applications in Geophysics. He has been working on DFOS-related research projects since 2014 and has authored dozens of publications and patents in this field. He is also interested in machine-learning applications and seismic imaging. He currently leads a research group focusing on hydraulic fracturing monitoring and reservoir characterization using DFOS measurements. Dr. Jin obtained his Ph.D. in Geophysics from Columbia University in the City of New York, and dual B.S. in Geophysics and Computer Science from Peking University. He worked as a research geophysicist in the oil industry for five years before joining the university in 2019.

## DGS Meeting Notes – July, 2022

**Attendees:** Mark Davidson, Xan Davidson, Jeff Zawila, Joel Scott, Jess Vahling, Andrew Keene, Angie Southcott

Minutes approved from June 2022.

Treasurer Report from Jess: A lot of money rolling in from golf tournament and sponsorships.

June net revenue: **\$14,883.15**

Refund from 3DSS Denver: **\$9,015.91**

**June expenses: \$944.76 (overhead and baseball game)**

**Survey monkey charges – helps with 3DSS voting as well as election (but \$55 monthly!?). Jess to reach out to Morgan to find out details.**

***eFirstbank balance: \$113,413.97***

Jess has new way of displaying expenses and month-to-month turnover of financials: do we as an excom like that? Folks like it – Jeff suggests to add lines across balances to help more easily see funds and associations. Only challenge is that it will not match bank statements because of timing changes with PayPal transfers and bank lags. Treasurer report approved.

Mark made address change official with Secretary of State and sent information to lawyers. Jess updated address with bank (eFirstbank) and PayPal. Jeff sent an email to SEG to let them know to update address. Still need to inform accountants and golf contract (Mark to follow up), Jeff to reach out to storage company and handle IT folks with Joel's help.

Got a piece of mail from the City of Denver – occupational tax evasion delinquency. We need to handle – Jess will scan and send to Joel to deal with. Seems like filing for 0 employees will handle issue.

**Xan: The Record went out!** We need to have an August newsletter to showcase candidates for upcoming excom committee election, special edition that is just for elections. A more complete edition to be sent out in October/November with technical work, updates, and the remainder of the normal inclusion. Golf tournament can also be included in election special edition.

Current Membership: **163 registered members**

**Candidates Discussion: Confirming candidates.**

**Luncheons:** Jeff has speakers set for remainder of the year. Jeff has meeting conflicting with August luncheon, Mark to coordinate this talk at Wynkoop on 8/11 (11:30 AM). Wynkoop sent Jeff an email that current room has a \$3500 food and beverage minimum, but there are two other rooms that may serve us better (since they only have \$300-500 minimum). Another option is DERL, and a third option is Maggiano's.

**Machine Learning AI Workshop** – large interest in folks leading it. First meeting next week and shooting for October to host event.

**Rockies Game:** Andrew to look into Rockies game at 1:10PM on September 22, 2022. He will contact Halliburton and IKON Science as potential sponsors.

**Funds:** One update – Joel spoke with Brian Plummer, wondering if we speak with surrounding universities to provide money for geophysics field camps or ask what they could possibly use. Only one we know of is CSM for Colorado. Joel to call and take point on this issue and determining who might get funding. This motion approved. Andrew to follow-up with professors in area for seismic monitoring, etc.

DGS Golf Tournament will have 62 participants! Need more volunteers!

**Meeting adjourned at 1:08 PM.**

## DGS Meeting Notes – August, 2022

### August 2022 DGS Excom Meeting

**Attendees:** Mark Davidson, Xan Davidson, Jeff Zawila, Joel Scott, Jess Vahling, Andrew Keene

**Meeting begins at 12:03PM.**

Minutes approved from July 2022.

*Treasurer report approved.*

*July Revenue: \$10,221.44*

*July Expenses: \$9,765.15*

**Motion approved to send Colorado School of Mines a \$10,000 endowment for field camp.**

**The Record:** Xan working to send The Record, awaiting Mark's contribution, bios, and few write-ups.

**Election:** Once we get everything published – survey monkey to vote for upcoming elections in September. Discussion on survey monkey costs of basic vs. advanced functionality. Jess to reach out to Morgan.

**Holiday Party:** Andrew to coordinate and schedule holiday party for 2022... this involves location, sponsorships, door prizes, and silent auction items. This would be December 8<sup>th</sup>, and we will plan to change the format of the silent auction (lower the cost). Andrew to reach out to Denver Petroleum Club for information on their sponsorships, etc.

**For 3DSS:** Pushing closer to the end of February, Mark to work on getting the ball rolling for that.

**Luncheons:** 24 attendees at previous luncheon and positive feedback!

**Workshop:** Committee met on July 20<sup>th</sup>. Setting the date is on the agenda – most likely in October. We need a logo and some flyers, registration website, and abstract email for folks to submit. Holding at DERL – need advertising in various newsletters.

**Baseball game** on September 22 is a go. Andrew to reach out to Joe from IKON and Jackie from Halliburton for potential sponsorships. Put up the registration page in conjunction with the Record release, one month out.

Plan is to have September meeting in person. Date would be 9/7/2022.

**Meeting adjourned at 12:41PM.**