DGS
DHAHRAN
GEOSCIENCE SOCIETY

THE OIL
DROP
A DGS Magazine

2018-2019
End of Term Edition

Contents

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DHAHRAN GEOSCIENCE SOCIETY

THE OIL DROP *A DGS Magazine*

About The Oil Drop

The Oil Drop newsletter was first released on June 1990, as a platform to share the latest activities and news of the Dhahran Geoscience Society. For the first few years, The Oil Drop was printed and photocopies were distributed to members at events and technical meetings. Over the years, The Oil Drop has evolved both in format and content to become a platform that connects its readers with not just the news of DGS, but also the latest advancements in their fields.

www.dgsonline.org

President Welcome Message:
Dr. Mohammed Al Duhailan

DGS is a professional scientific society with all about generating content and attract wider audience.

From our earliest DGS chapters onward, members have carried the geoscience society in Dhahran through decades of excellence. Remarkable growth and success has always been achieved throughout the years. The DGS has endured because of the impressive dedication by its successive executive committees ensuring the steady progress towards the society's strategic goals.

As a professional scientific society, our team led the society throughout the term of 2018-2019 to expand events and activities across three platforms; technical, professional and public outreach. This has ensured a sustainable focus on generating content, attract wider audience and lead the DGS to become a globally-recognized professional society that enables regional geoscience professionals to share knowledge. Our commitment was evident in creating three initiatives; Explore, Grow and Enquire.

We have focused on "branding" and organizing all activities into well defined themes, public awareness (High-school visits and activities), members & family engagement (DGS Family Festival), and voluntary and charity work (Orphanage visit to Ithra). Also, we have been promoting "inquiring minds" throughout events (e.g. technical luncheons, dinner meetings and sponsored awards for student technical excellence) that encourage participants to expose technical doubts, arguments, and evaluate solutions. Our focus also includes promoting "Personal Growth" throughout events targeting career advancement, innovation challenge, mentorship and specialty awareness.

I hope this term has been a joy to you as much as it is to us, and I wish all the best to the upcoming DGS team of 2019-2020.

Sincerely,
Dr. Mohammed Al Duhailan
DGS President

Meet the Team: 2018-2019
Elected Executive Committee

Mohammed AlDuhailan
President

Khalaf AlTemimi
President-Elect

Abdulaziz AlMansour
VP of Public Outreach

Musab AlModrra
VP of Professional Development

Khaled AlDulaijan
VP of Technical Exchange

Soaad AlEnazi
Secretary

Lujain AlGhannam
Public Events Officer

Saad AlShehri
Professional Meetings Officer

Fayrouz AlEssa
Technical Meeting Officer

Yasmina Kechida
Field Trip Coordinator

Nasher AlBinHassan
Social Media Officer

Hassan Al Ismael
Young Professional Officer

Dennis Marbebe
Technical Publication Officer

Younus Shaikh
Treasurer

Noha Lababidi
Membership Liasion Officer

Dana Al Jishi
Mentorship Program Officer

Abdullah AlHadab
Academic Liaison Officer

Meet the Team: 2018-2019

Interview with Mr. Misfir AzZahrani, Executive Director of the Exploration Organization

Mr. Misfir AzZahrani is the Executive Director of the Exploration Organization, and a long time supporter of the activities of the Dhahran Geoscience society. Here, we sat down with Mr. AzZahrani and we asked him a few questions.

Good day Mr. AzZahrani. It is pleasure to have you with us today. First, we would love to know more about the drivers that led you to where you are today. **Would you please share with us how you first got into geosciences, and what drove you to join the Oil and Gas Industry?**

Mr. Misfir AzZahrani, Executive Director of the Exploration Organization at Saudi Aramco

Good day. Well, I grew up in a region where Helicopters used to land on top of its mountains with geoscientists examining scattered pieces of rocks from ancient mines. Reminiscence of the scene attracted me in this field. I did become that geologist, but one who search for black gold instead.

What are some key skills that could make or break a professional in our business?

What distinguishes an effective exploration geoscientist is being innovative, integrative, positive, and an effective team player.

How about you? What personal attributes have contributed to the

professional status that you enjoy today?

Throughout my journey of shaping up my career I give credit to those Gurus in the fields of Stratigraphy, Field Geology, Paleontology, Structural geology, Basin modeling, Operation Geology who fully supported me with knowledge transfer in their own unstructured ways.

With the big influx of the young professionals joining the workforce with the enthusiasm of being responsible & successful, what word of advice and inspiration do you have for them?

Once again, the best advice for young professionals is to be innovative, integrative, positive, and an effective team player in order to become a truly successful exploration geologist.

Knowledge transfer is one of the biggest challenges in Oil & Gas industry. There are many ingredients such as, managements, mentors, and mentees. What do you think is the perfect recipe to guarantee synergy, sustainability, and smooth transformation of knowledge?

Seriousness of mentors and mentees along with support of management, and establishing the necessary systems are essential requirements for successful knowledge transfer.

Another question related to the knowledge transfer; how important for professionals in our business to

publish, especially that they are so busy with the rapid and demanding daily operations?

It is very important for professionals to document their work and leave track of their findings or recommendations.

Likewise, it is important for professionals to be recognized and known in their fields by publishing what is permissible and carefully reviewed.

Let us move to a very important topic; technology. High performance computing, artificial intelligence and data cloud... How would they shape the future of geoscience?

Geoscience involve many different disciplines, each discipline acquire big data. Integrating this huge amount of data for reliable conclusions requires help of technology. Identifying the proper technologies and solutions of IR 4.0 will help reduce cycle time and cost, and improve quality.

What advice do you have to the geoscientists today to co-up with this new era of high technology & machine learning? Bearing in mind that a lot are worried that a machine might replace them!

Sciences in general and geoscience in specific require human intuitiveness, inferences and interpretations. Nature

have supplied different basins of the earth with different sedimentary systems underwent different circumstances. In addition, certain parts of the earth experienced different structural evolution than others. Therefore, machines will not make the analyses but they will indeed help to produce faster results with higher certainty, resolution, and efficiency.

DGS is grateful to Exploration for the huge support that we receive, and your view means the most to us. How do you rate DGS performance in the last 5 years and what are your expectations from DGS in the next 5 years?

DGS is only platform in the area where geoscientists meet, interact, and share knowledge and experiences. It had played important role in serving the community during the past five years. The great achievements of DGS are attributed to its volunteering officers and their sense of responsibility towards giving.

It was an honor to have you with us today Mr. AzZharani. Thanks for giving us the opportunity. Would you like to add a final word?

Thanks and best wishes

Professional Development Platform

In the DGS Professional Development Platform, the Society promotes "Personal Growth" throughout events targeting career advancement, innovation challenges, mentorship and specialty awareness. Local and world-renowned scientists and professionals were invited to present their work and share their experiences at the Dhahran Geoscience Society (DGS) Dinner Meetings as part of the society's mission to expand the knowledge of its members in the Oil and Gas Industry. Members of the Dhahran Geoscience Society and industry professionals attended those meetings to gain an insight into significant industry relevant issues while simultaneously utilizing those unique opportunities to socialize and expand their professional network.

grow!
DGS initiative

Dinner Meetings Series

In the past year, four DGS dinner meetings included a choice selection of keynote guests.

Didier Houssin

On October 8, 2018, DGS welcomed Didier Houssin, Chairman and CEO of IFP Energies Nouvelles in the first Dinner Meeting. Didier gave an interesting talk titled "Oil and Gas in the Energy Transition: The Role of Research and innovation". In his talk, Didier elaborated on the important role of the oil and gas sector in the energy transition, and the latest advances in research and innovation.

Denise Cox

On December 4, 2018, DGS welcomed Denise Cox, AAPG President 2018-2019 and Storm Energy, Ltd. President, at a dinner meeting. Denise shared her ideas with regards to Big Data, Analytics and the Value of Diverse Perspectives – An Example from the Permian Basin, West Texas, USA in front of a large audience of geoscience professionals in the Eastern Province of Saudi Arabia. The event was high-spirited and intellectually stimulating as she made an effort to connect all the technical aspects of the topic to her vast personal and work experience.

Robert R. Stewart

On February 27, 2019, DGS welcomed Robert R. Stewart, the 2018-2019 president of the Society of Exploration Geophysicists. Robert gave a talk titled "Where is Exploration Geoscience Going?"

In his talk, Robert touched on the future of the exploration geoscience from the point view of technology, training and academia, and on the vital role of professional society in guiding the Oil and Gas industry.

Dr. Michael Poppelreiter

On April 3, 2019 the Dhahran Geoscience Society (DGS) hosted the 2019 EAGE President Prof. Dr. Michael Poppelreiter who presented the "EAGE Vision 2025: Building the Most Innovative Geoscience Association". Michael emphasized the long-term collaboration between the two organizations since signing the Agreement of Association in 2001.

He also elaborated on the topics that EAGE will be focusing in the coming years to be fit for the future. This will include climate change and green agenda, energy transition as a new business, digitization as a new value proposition for members, uncertain macroeconomics and volunteerism.

Michael spent a lot of time discussing the enabling framework for the Vision 2025. In line with this, EAGE will have an agile governance, robust IT media, create value for members and have sustainable finances. A couple of special interest communities that was created by EAGE were highlighted such as the Young Professionals, Women in Geoscience and Engineering, Decarbonization and Energy Transition and Artificial Intelligence. One particular special interest group that is close to Aramco's heart in the Emerging Unconventional Energy Resources was initiated by our very own Dr. Mohammed S. Ameen, a Principal Professional from Unconventional Resources.

He also talked about the mentorship program offered by EAGE to young professionals. He encouraged everyone to participate and give a helping hand to new bloods that are joining the industry.

Young Professional Development Series

Denise Cox, AAPG President 2018-2019 and Storm Energy, Ltd. President facilitated a lively discussion with Saudi Aramco's Young Professional community that covered a gamut of topics on December 4, 2018. The YP's were all delighted and inspired by her experience and innate predilection towards the younger generation as an agent of change and drivers of innovation.

the committee, the activities programmed by the WNC during the Annual Meeting in Anaheim, and the resources available to boost the presence, soft skills, and technical skills of women in the workforce of the oil and gas industry and in geophysics at large.

Q&A followed the session that provided an opportunity for the attendees to inquire and get insights about their own career paths. It was very interactive as she shared her life lessons and the participants took her advise to heart.

As an Honorary Lecturer of SEG, Maria Angela Capello, Kuwait Oil Company (KOC) Executive Advisor, delivered a session solely dedicated for women to brief about the SEG Women's Network Committee (WNC), an initiative launched by the Board of Directors of SEG to empower the participation and success of women in geophysics around the globe.
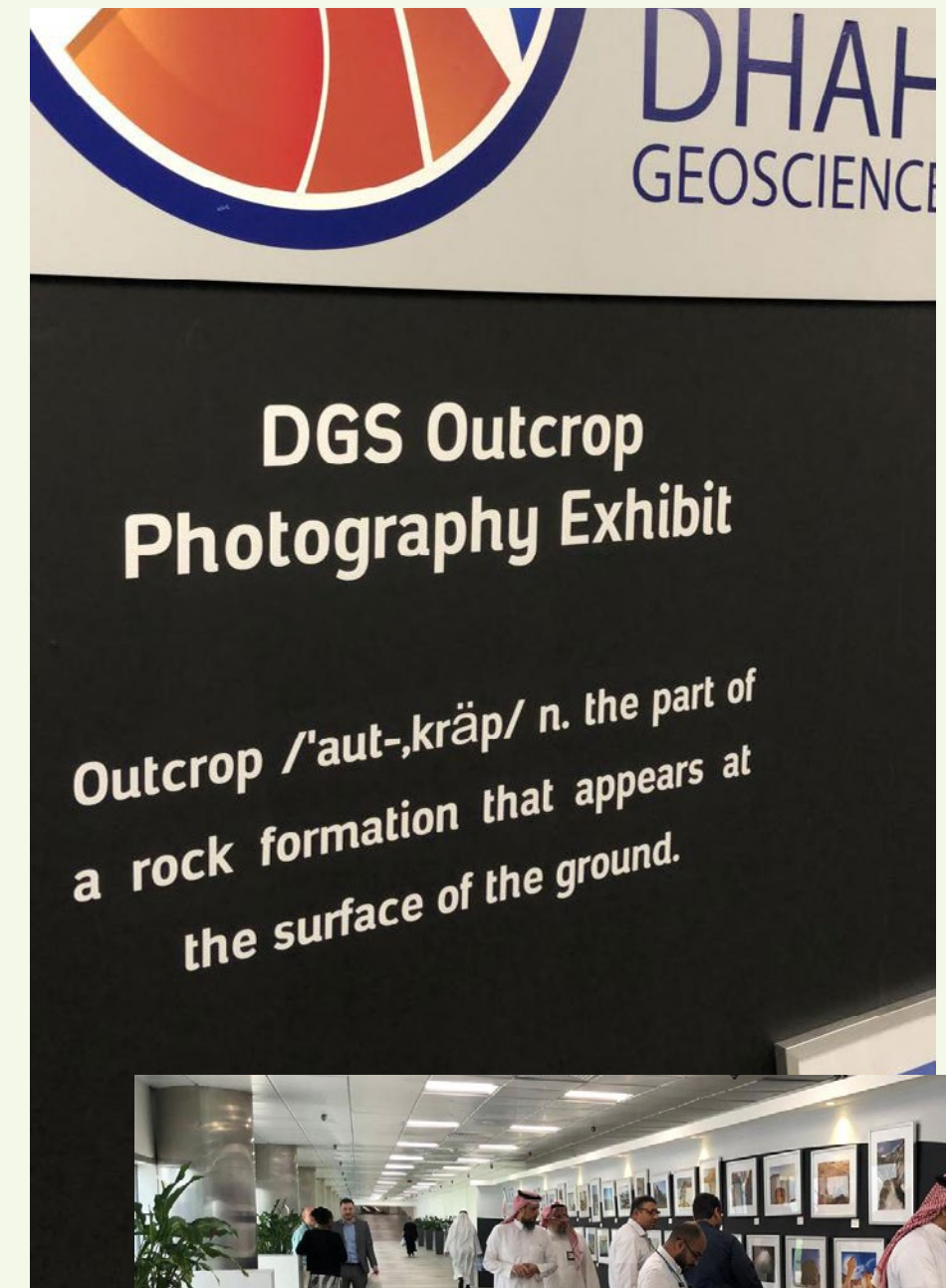
The session raise the awareness about the activities steered by

DGS Outcrop Photo Contest

Have you been to the field before whether on a trip to the desert, on a hiking trip, or a geology field trip during which you stopped at a beautiful outcrop to take a photo?

On April 21st, 2019, the Dhahran Geoscience Society organized the first DGS Outcrop Photo Contest and exhibition. DGS members were invited to submit their best photos of outcrops, and a selection of their submissions were then printed and displayed in a three-weeks exhibition. Electronic voting was open during the exhibition where audience are encouraged to vote for the best outcrop photo. Winners of the first DGS Outcrop Photo Contest are listed below.

Ranking	Name	Ranking	Name
1st Place	**Mostafa A Alabudib**	Runner up	Gentur S Suhargo
2nd Place	**Alaa A Othman**	Runner up	Mohammed M Sadah
3rd Place	**Hussain S Sinan**	Runner up	Rakan M Alhumaid
Runner up	Deema J Badan	Runner up	Ahmad A Dossary
Runner up	Omar K Mohammed	Runner up	Fahd A Badgaish

1st place
Mostafa
A Alabudib

3rd place
Hussain S
Sinan

2nd Place
Alaa A
Othman

Technical Exchange Platform

In the DGS Technical Exchange Platform, the Society promotes "inquiring minds" throughout events that encourage participants to expose technical doubts, arguments, and to evaluate solutions.
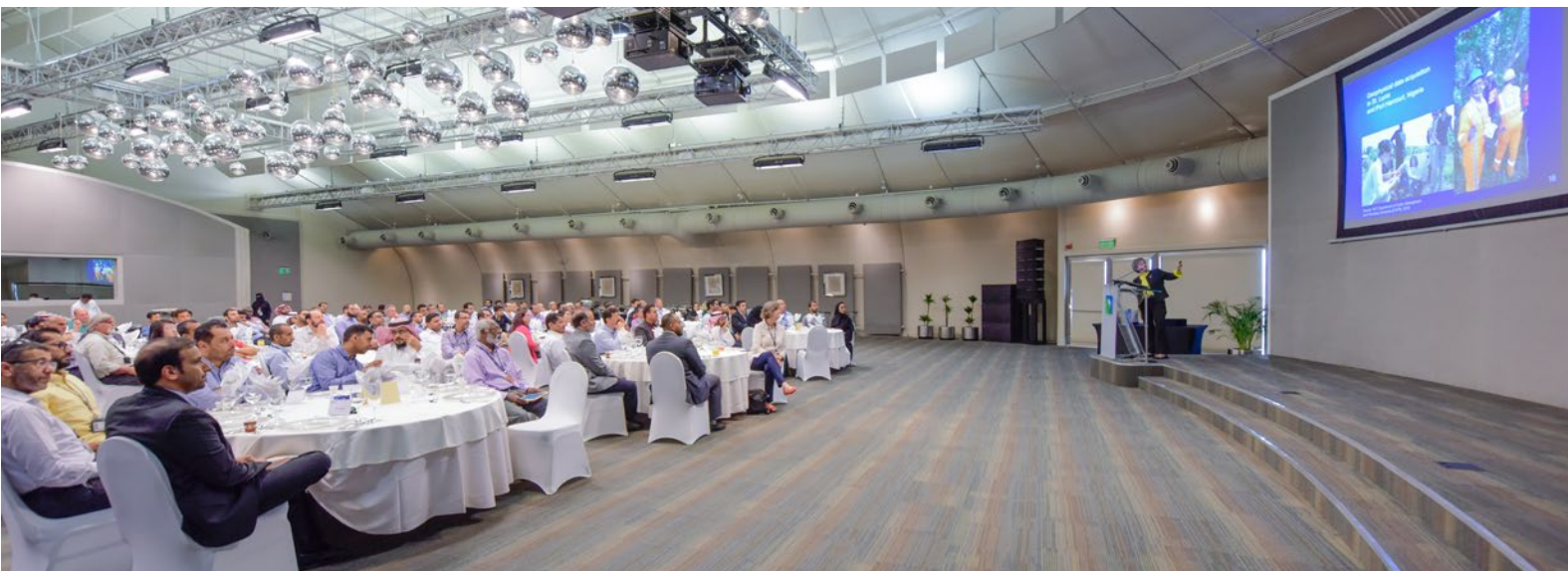
inquire!
DGS initiative

Technical Luncheons Series

In the DGS Technical Luncheons Series, the society has organized six technical luncheons as part of the society's mission to expand the technical knowledge of its members in the Oil and Gas Industry.

professionals with the language of other fields such as reservoir engineers, drillers and ecologist is a key for sustainability strategies in global energy supply and for enabling the planet's ecosystem preservation guidelines.

Ronald Steel

The Dhahran Geoscience Society (DGS) hosted a technical luncheon entitled "Sequence Stratigraphy: It Is Changing" on October 25, 2018. The speaker was Ronald Steel, a Professor & Davis Chair at University of Texas, Austin and an honorary professorial fellow at Heriot-Watt University, UK.

Maria Angela Capello

For the first luncheon meeting in September 3, 2018, Maria Angela Capello, Kuwait Oil Company (KOC) Executive Advisor, presented the evolving challenges of the exploration geophysicist's profession. She introduced a notion that the exploration geophysicist is already a stereotype that needs to be left in the past. An injection of new skills and equipping the

Dr. Abdullah Mah

The December 2018 luncheon hosted Dr. Abdullah Mah, Senior Remote Sensing Specialist in Aramco's Project Management Office Department (PMOD). He talked about remote sensing, a method that is not been widely utilized in the oil and gas industry. He elaborated on the use of remote sensing as a valuable complementary tool to enhance hydrocarbon exploration and, subsequently, increase the rate of success in finding oil and gas.

Jerry L. Jensen

The January 2019 luncheon featured Jerry L. Jensen who is an Engineering Researcher at the Bureau of Economic Geology in Texas, USA and an Emeritus Professor at the University of Calgary in Alberta, Canada. Jensen's talked highlighted the importance of identifying and exploiting geological controls on interwell communication (IWC).

Understanding geology and modeling its IWC effects will help engineers design an efficient recovery strategies by guiding well spacing, stimulation treatments, and injection profiles, and reduction of produced water. Through several field examples ranging from conventional to unconventional fields, Jensen was able to show the various ways IWC reveals an insight about geology.

Atanu Basu

The February 2019 Technical Luncheon hosted a very interesting topic that excited and provoked many of the attendees intellect. Atanu Basu is the CEO & Founder of Ayata which develops artificial intelligence software that helps corporations make smarter decisions about the future. His talk was entitled "How would Google Drill? Learning from AI advances by the Tech Pioneers".
He talked about how the oil and gas industry – an $8 trillion global industry that makes some of the most complex decisions conceivable – can capitalizes on the huge advances in AI.

Joseph Mathew

The April 2019 Technical Luncheon hosted Joseph Mathew of the JV Support & Financial Consulting Department at Saudi Aramco. Joseph presented a very unique and exciting talk on "extracting value in the Oil and Gas industry", where he explained how value is extracted and quantified in an International Oil company in general, and Saudi Aramco in particular.

The 2019 DGS Distinguished Lecturer Program

One of Dhahran Geoscience Society's most important programs is the Distinguished Lecturer Program (DLP). The DLP is a series of lectures in the field of geoscience provided by a DGS member to educational institutions in the Kingdom of Saudi Arabia. Dr. Mahdi Almutlaq, who is working at the Strategic Planning & Optimization Team (SPOT), was nominated by the 2018-2019 DGS Executive Committee to be the first Distinguished Lecturer in 2019.

The program had four universities on its agenda, starting with King Fahad University of Petroleum and Minerals in Dhahran, King Saud University in Riyadh, Taibah University in Madina, and finally King Abdulaziz University in Jeddah. The tour started in February 03, 2019 and lasted for four days.

The title of the lecture was "Recognizing Data Uncertainty in Petroleum Exploration". It highlighted the data uncertainty definition and how it's perceived in practice. The presentation was supported by real data examples from encountered problems in seismic data processing and interpretation.

The lecture emphasized the need for recognizing data uncertainty and minimizing it with the appropriate technique, such as calibration of seismic data to existing borehole data. This rigorous practice will lead to a more accurate result, minimize overall workflow time, avoid repeatability of work, and achieve exploration business requirements.

Dr. Mahdi Almutlaq shared his experience on the 2019 DGS Distinguished Lecturer Program by saying that the whole experience was unique starting from preparing the lecture, communicating with DGS executive committee, connecting with universities representatives, and finally the trip planning.

Self-satisfaction is sensed immediately after every lecture is delivered, Dr. Almutlaq continues. I believe it is due to the observed high level of attendance and interaction from young geoscience students as well as university faculties. For those who are seeking for a venue to give back to their community, I strongly recommend that they approach the DGS DLP Executive Committee with their proposed ideas.

Dr. Mahdi H. Almutlaq is working at the Strategic Planning & Optimization Team (SPOT), Prospect Portfolio Development at the Exploration Organization, Saudi Aramco.

Dr. Mahdi Almutlaq shares his experience on the 2019 DGS Distinguished Lecturer Program
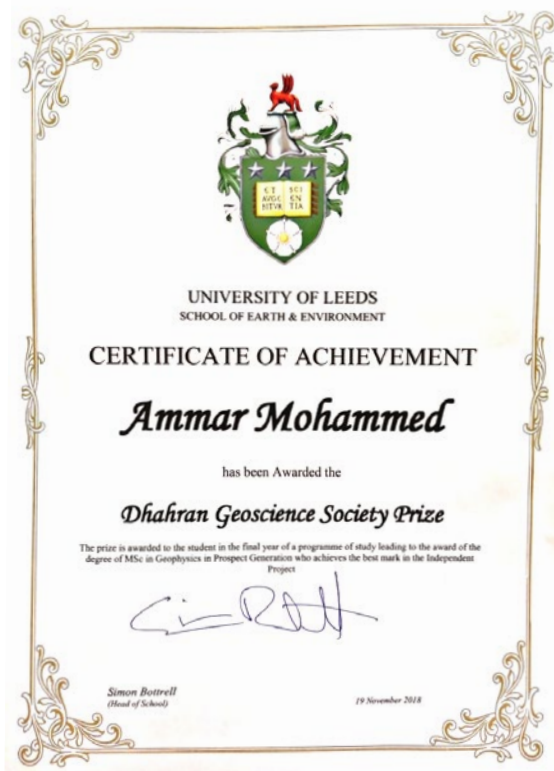
DGS Technical Achievement Prize

Training and Development (T&D), in collaboration with Exploration, developed the initiative to give employees the opportunity to obtain a Master of Science in Geophysics at the University of Leeds, UK. The program aims to provide students with expertise in the integration and critical analysis of datasets used for both exploration and prospect generation. Program participants gained a comprehensive understanding of the entire petroleum exploration process, including data acquisition and processing geophysical analysis of subsurface data, and derivation of geologically realistic models.

The first cohort of the program started in September 2017 with 28 participants. They successfully completed their degree requirements and the program concluded in October 2018.

The DGS Prize is awarded to the student in the final year of program of study leading to the award of the degree of MSc in Geophysics in Prospect Generation who achieves the best mark in the Independent Research Project.

For the recent batch, Ammar Mohammed took the award. He is an exploration geophysicist currently working for the Emerging Unconventional Assets Department.

Ammar's project was about predicting sweet spots using an integrated rock physics model in an unconventional Jurassic carbonate source rock. Sweet spots are defined in his study as areas with both high reservoir and high completion qualities. The method used

UNIVERSITY OF LEEDS
SCHOOL OF EARTH & ENVIRONMENT

CERTIFICATE OF ACHIEVEMENT

Ammar Mohammed

has been Awarded the

Dhahran Geoscience Society Prize

The prize is awarded to the student in the final year of a programme of study leading to the award of the degree of MSc in Geophysics in Prospect Generation who achieves the best mark in the Independent Project

Simon Bottrell   19 November 2018
(Head of School)

DGS Technical Achievement Prize University of Leeds MSc Geophysics in Prospect Generation (Aramco-hosted MSc Programme)

three rock properties (Total organic content, Young's modulus and Poisson's ratio) from well data to define the sweet spots and to identify the desired cutoffs of two seismic attributes/elastic properties (lambda-rho and mu-rho) that represent the sweet spots in terms of reservoir quality and completion quality.

To map the distribution of the sweet spots in the study area, two inverted 3D seismic blocks (lambda-rho and mu-rho) were filtered using the desired cutoffs. The results show a good distribution of sweet spots in the study area. The business impact of identifying sweet spots is enhancing the production potential of hydrocarbon as well as making the completion process more effective in terms of time and cost.

Integrated Rock Physics Model to Predict Sweet Spots in an Unconventional Jurassic Carbonate Source Rock, Saudi Arabia

Ammar Mohammed

Abstract

The exploration of unconventional hydrocarbon resources in Saudi Arabia mainly targets the tight source rock reservoirs where hydraulic fracturing is needed for an effective hydrocarbon production. This project aims to predict areas with good hydrocarbon production potential that can be effectively stimulated/fractured, known as sweet spots, in a tight Jurassic carbonate source rock in eastern Saudi Arabia.

A rock physics model was developed to link the seismic properties to rock properties of the target formation. Three main rock properties are used in this study to define the sweet spots: total organic content (TOC), Young's modulus (YM) and Poisson's ratio (PR). TOC is a geochemical property that is related to the production potential and obtained in the laboratory from core, while YM and PR are elastic properties that are related to the frackability (how easily the rock is to hydraulically fracture) of the rock that are obtained from density and sonic (compressional and shear) logs.

The sweet spots are characterized in this study by high values of TOC,

high values of YM and low values of PR. Using well data, these three properties were cross-plotted against two elastic properties (lambda-rho and mu-rho) that are calculated using sonic (compressional and shear) and density logs to obtain linear relationships between them. Cutoffs of lambda-rho and mu-rho were chosen which represent the sweet spots in terms of TOC and frackability. These cutoffs were then used to map the distribution of sweet spots in the study area by filtering two inverted 3D seismic volumes of lambda-rho and mu-rho.

Results show that sweet spots are characterized by low values of lambda-rho and mu-rho, and are well distributed in the study area especially the northern half where the source rock interval is generally deeper. Furthermore, it was observed that TOC has a positive relationship with depth indicating probably better accumulation and/or preservation of organic matter in the deeper parts of the study area. In addition, results show that TOC has a negative relationship with frackability which means that the deeper areas with the highest TOC values are more difficult to frack compared with the shallower areas with lower TOC values. Therefore, it is important to consider both reservoir quality and completion quality of the targeted formation when predicting sweet spots for more economical hydrocarbon production.

Workshops and Technical Field Trips Series

Near Surface Modeling and Imaging Workshop

Co-organized with the Society of Exploration Geophysicists (SEG), the Near Surface Modeling and Imaging Workshop was held in Manama, Bahrain on the 17th and 18th of March 2019. The workshop tackled on the previous discussion in 2014 and 2016 to address persistent challenges including: insufficient acquisition design, first break picking, amplitude preservation, surface related multiples, high-resolution near-surface velocities, near-surface geological modeling, joint inversion, and maximizing the use of non-seismic data. It also leveraged on the advancements in high-performance computing while considering the elastic nature of the data.

The following session topics were discussed:

• Near Surface Considerations During Survey Design and Acquisition

• Utilizing Coherent Noise and Multiples in the Modelling and Reconstructing of the Near-Surface

• Capturing and Modeling High-Resolution Near-Surface Velocities

• Advancements in Non-Seismic Technologies

• Elastic Data Technology Implementation

• Joint Inversion Techniques

• Advancement in FWI, Interferometry and Automatic Picking

EAGE/DGS Jurassic Field Trip

spectacular west-facing continuous cuestas extending 1000 km North to South near Riyadh. To date, few studies have addressed the Jurassic outcrops of Central Arabia (e.g., Bramkamp and Steineke, in Arkell, 1952; Powers et al., 1966; Powers, 1968; Manivit et al.,1990). These last comprehensive studies involved lithostratigraphic and biostratigraphic approaches. However, genetically related depositional sequences, cycle hierarchy, stacking patterns, depositional environment evolution, and effects of syndepositional tectonic events were not documented in detail

This field trip presents one of the first attempts to apply modern sequence stratigraphic techniques to outcrops to improve our understanding of the Jurassic system regionally and globally. Moreover, the field trip reveals for the first time depositional models that subdivide the Shaqra Group into genetically related sequences that are not always obvious from core, wireline logs or seismic data. These observations provide better significant understanding of the Jurassic history and tectonostratigraphic events of the Arabian Platform.

In January 2019, DGS together with EAGE successfully hosted the first and inaugural field trip to the Jurassic outcrop in Riyadh, Saudi Arabia, that was headed by Dr. Abdullah Al-Mojel. Local and international attendees (over seventeen participants) with different background from university and oil companies had active participation and fruitful discussion.

The Jurassic outcrop (Shaqra Group, Toarcian to Kimmeridgian) is the westernmost and landward stratigraphic record of the Jurassic stratigraphy (Marrat, Dhruma, Tuwaiq, Hanifa, Jubaila and Arab-D). These outcrops are well exposed and easily accessible along the Tuwaiq Escarpments forming

The results of five years' fieldwork was presented in comprehensive three days trip. The field trip demonstrates an integration of the previous biostratigraphic data with detailed new sedimentological measured sections (totaling of 15,000 ft) and subsurface gamma-ray logs, offering robust depositional models and high-resolution sequence stratigraphic frameworks. This integration provides a comprehensive reference for the most economically important formations in the Arabian Platform. This rock-based and direct assessment provides guidelines for reservoir modeling, hydrocarbon exploration, prediction of reservoir distribution and improve seismic interpretation. The continuous record of the Jurassic can contribute to a broad understanding of controlling factors and reconstruction of the paleogeography of the Arabian Platform as well as the Neo-Tethys Ocean.

About the instructor

Dr. Abdullah Al-Mojel is a sedimentologist and sequence stratigrapher in Saudi Aramco, Southern Area Reservoir Characterization Department. He received a BSc from United Arab Emirates University, Al-Ain in 2004. After graduation, he joined Saudi Aramco in Dhahran, where he worked in reservoir and field development in the subsurface. He received his MSc from King Fahad University in 2010 and his thesis was on facies and sequence stratigraphy of Lower Fadhili Reservoir (Middle Jurassic) in Khurais Field. In his PhD Thesis (2017), in cooperation with P. Razin, Y. Lenindre and D. Vaslet in Bordeaux University , France, he advanced a new sequence stratigraphic scheme for the entire Jurassic of Central Arabia.

Membership Update
Become a member

To register scan this QR code

For more enquiries about membership, please contact the membership liaison

Email   membership@dgsonline.org

Get Involved
Become a Volunteer
Contact: volunteer@dgsonline.org

Public Outreach Platform

In the DGS Public Outreach Platform, the Society is expanding its outreach and is focusing on "branding" and organizing all activities into well defined themes. In the past term, these themes included:
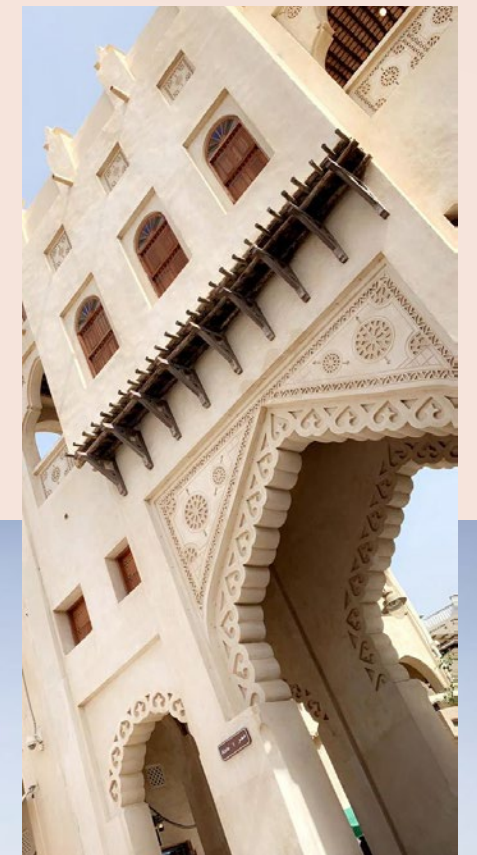
· The public awareness theme that includes high-school visits and activities
· The members & family engagement that includes the DGS family Festival and membership campaigns
· Establishing a platform for volunteering and social activities such as organizing day trips to Ithra for orphans and kids fighting cancer

In addition, the public outreach platform launched an initiative named "Explore!" to promote the "Geoheritage" in the Kingdom of Saudi Arabia and the Eastern Province in particular. This DGS initiative will introduce a unique framework to promote the "Geoheritage" as a collaborative effort with the tourism sector. Apart from traditional DGS geological field trips, the "Explore!" Initiative will work closely with the relative entities to develop a platform of cooperation and exchange between experts and practitioners in geological and geomorphological heritage matters.

Field Trips

Land Seismic Acquisition Field Trip

February 16, 2019

Three hours drive from Dhahran, the DGS delegation went behind the scenes of how seismic data were acquired in the field. The WesternGeco Crew-S83 welcomed the team and provided a very comprehensive and educating day for the group.

Al Hasa Heritage Tour

December 15, 2018

As part of "Explore!", a DGS initiative to promote geoheritage sites in the Kingdom of Saudi Arabia, a group of delegates went for a 1-day heritage tour of Al Hasa which includes a visit to the camel market, the Qaysariyah, Jawathat Park and The Jabal al-Qarah caves as one of the main attractions in Hofuf.
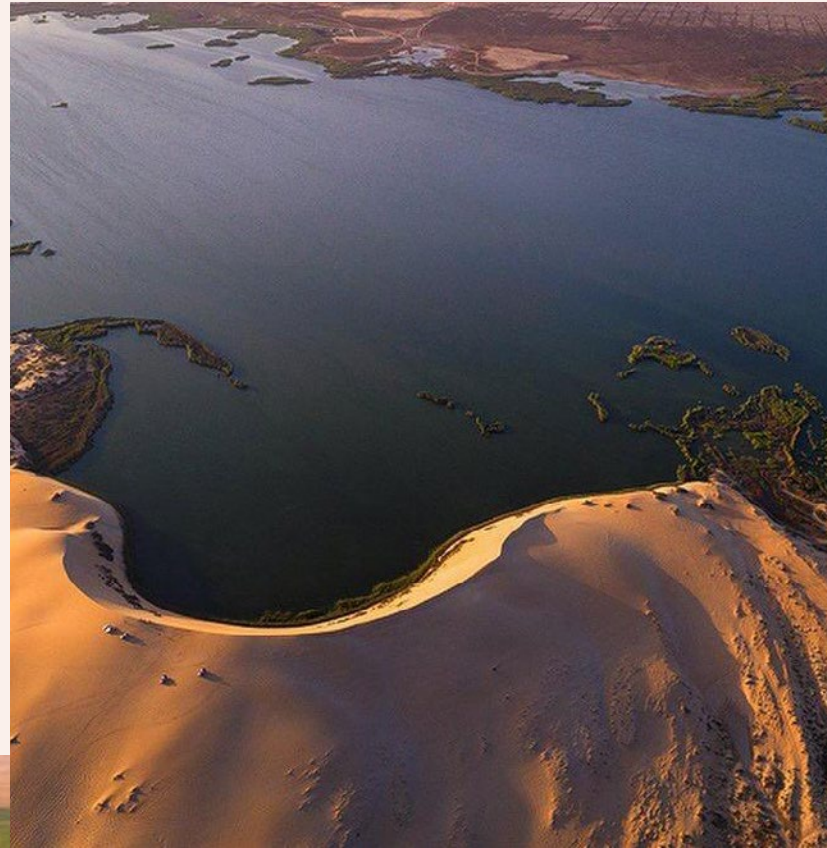

explore!
DGS initiative

Al Asfar Safari Trip

December 22, 2018

As part of "Explore!", a DGS initiative to promote geoheritage sites in the Kingdom of Saudi Arabia the DGS organized a safari trip to the Al Asfar Lake, the world's largest oasis located in Saudi Arabia.

DGS FAMILY FESTIVAL

On Friday March 22, 2019, the Dhahran Geoscience Society (DGS) held its second DGS annual Family Festival for its members and their families at the Kings Road Park in Saudi Aramco's main camp.

castles for the younger guests.

The event recorded the highest attendance throughout the term, 1,430 checked-in guests, and over 7,100 social media interactions including the SnapChat filter interactions, Twitter impressions, and Instagram Reach.

The Family Festival aims to introduce family members to DGS and socialize in a family friendly environment. The event was announced and open for the Dhahran Community as well as DGS members, which helped expand DGS public outreach. The festival extended from 12 until 7 pm in which families and their children enjoyed various carnival and festival games, live music and the food trucks. The fun activities included a kid's corner, carnival games (ball games, puzzles, coordination games, bowling, target games etc.) and three inflatable

The DGS Family Festival team received outstanding feedback from guests and members who requested to have this event annually. The success of the event is attributed to those who helped from the community team, DGS members, and volunteers. For that, we want to take this moment to thank them for their remarkable contribution to make this a successful event.

DGS Volunteering and Social Outreach Program

As part of the DGS Public Outreach efforts, the society has established a volunteering program for its members to participate in charitable activities and social visits. For the events in the Volunteering and Social Outreach Program, the society handles all logistics in terms of transportation, catering, gifts and giveaways, while the members volunteer their valuable time and energy.

the kids had the chance to explore the center and interact with the volunteers in a fun environment.

In another collaboration with Pediatric Oncology Clinic at the King Fahad Specialist Hospital (KFSH), the DGS has organized two events to celebrate the courage of childhood cancer warriors. The two events aims to ease the difficult journey that the kids face by brining them some joy and gifts, and to raise awareness to the public of the continuing danger that this disease and current treatment options pose to the health of children.

(Ithra) for the out-patients kids who are fighting cancer and their families. During this visit, the kids and their families had the chance to explore the center and its facilities, interact and learn from our volunteers in a fun environment.

The Volunteering and Social Outreach Program concluded its activities for the term with the DGS Ramadan Food Basket Campaign, which was organized in collaboration with "albarakah" Charity Organization in Dammam. DGS volunteers boxed and delivered 14 food baskets and grocery vouchers to 11 families in need that had 79 family members.

The Volunteering and Social Outreach Program kicked off its activities with a collaboration with "Benaa" Charity Organization that cares for orphans in the eastern province. The DGS organized a half-day trip to the King Abdulaziz Center for World Culture (Ithra) for 30 kids and their family members. The kids and DGS volunteers were divided in groups of five, where

The first of those two events was the in-hospital visit to hospitalized patients, which took place on the 20th of March, 2019 which was the International Day of Happiness. DGS volunteers were divided into groups of two and visited each patient carrying gifts and spreading happiness. For the second event, the DGS has organized a half-day trip to the King Abdulaziz Center for World Culture

The Challenges and Prospects of Artificial Intelligence in the E&P Business

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Introduction

Building on the IT infrastructure provided by the third industrial revolution, the fourth has evolved with the recent advancements in Artificial Intelligence (AI), Internet of Things, Big Data, Robotics, Nanotechnology, and 3D/4D Printing. Despite that AI has applied in other fields for over four decades, its application in the petroleum industry has been sparse and limited. This article shares some of the challenges of AI implementation in the E&P industry and recommends some tips for successful implementation.

Overview of AI and Machine Learning

AI has been defined as "the science and engineering of making intelligent systems". It should be noted that those "intelligent systems" could be hardware (e.g. robotic arms doing some repetitive jobs like capping drink bottles), software (e.g. algorithms that detect events and anomalies), or a combination of both (e.g. autonomous rovers that make independent decisions on what to do based on certain situations). AI has evolved from being a branch of computer science into an umbrella field that covers other sub-fields such as Natural Language Programming (NLP), Expert Systems, Robotics, and Computational Intelligence (CI). CI, also known as soft computing or neural computing, uses any or a combination of the knowledge discovery, pattern recognition, and data mining processes to develop machine learning workflows. One of the various machine learning techniques that can be employed is Artificial Neural Networks. Others include Decision Tress, Random Forest, Support Vector Machines, Extreme Learning Machine, Fuzzy Logic Types I and II, ANFIS, and Nearest Neighbors. The new and evolving field that uses various scientific methods, processes, algorithms and systems to extract knowledge or insights from data in various forms, either structured or unstructured, is called Data Science.

The major tool used for data mining today is Machine Learning (ML). ML can be defined as "the process of teaching computers to do what humans naturally do without being explicitly programmed or relying on rules-based programming". Through ML, algorithms are able to continuously learn from experience depicted in data and over time improve their predictive capabilities. There are three ML methods: supervised and unsupervised learning. Supervised ML algorithms seek to learn patterns from historical examples (called training dataset) to generate the outcome of future events. Typical applications of this learning method are regression and classification. In contrast, unsupervised ML algorithms seek to make inferences from events depicted by data without prior classification or label. They seek to infer a function, usually based on some distance metric, to describe a hidden structure from unlabeled data. From this result, an expert can derive meanings that can lead to new insights. A typical application of this is clustering. Recent advances in ML include hybrid, ensemble, and deep machine learning methodologies.

The traditional ML workflow is shown in Figure 1 while a little more details on how machine learning works is shown in Figure 2.
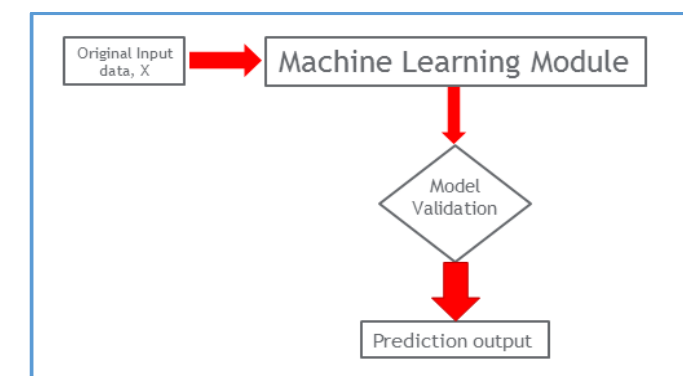

Figure 1: The conventional machine learning workflow
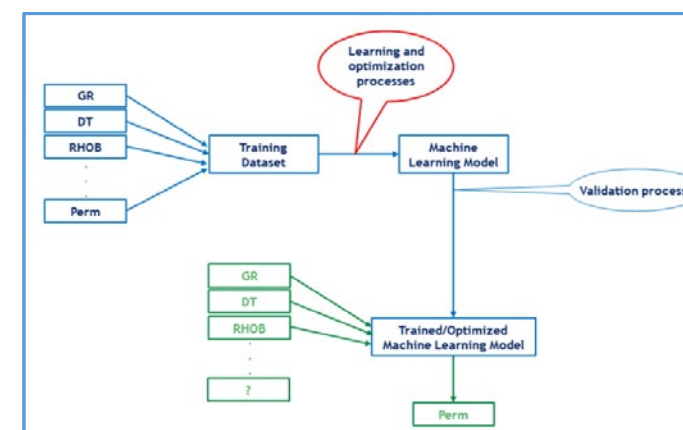

Figure 2: How machine learning works

Challenges and Limitations of Machine Learning

Despite that ML has been around for over four decades, not so much progress has been made in its adoption at the industry level. The few successful applications have been isolated and sparse. The following could be the reasons:

It requires substantial data.

Poor quality data.

The learning process requires a degree of expertise.

Focus on pattern in data rather than the physics of the problem.

Recommendations for Successful Application

Given the challenges outlined above, a few tips and recommendable best-practices are necessary for a successful admission of the ML paradigm in the petroleum industry. Below is a selection of such recommendations:

The need to spend enough time on the quality assurance of the data.

The need to extract the right features that describe the problem to be solved.

Seeking to understand the ML techniques rather than using them as black boxes.

Making the products of ML projects easy to use by investing enough time to build user-friendly and simple user interfaces.

ML is not a magic wand. It may not solve "all" problems. Attempting to use it as a blanket solution that "must" work in "all" situations is not right.

Conclusion

This article gives a basic introduction to artificial intelligence and machine learning. It shares some of the challenges and limitations of machine learning and gives some recommendations to ensure successful application in the E&P industry.

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All Events 2018 - 2019

Date	Event
September 1, 2018	DGS Volunteering and Social Outreach Program: Orphans Eid trip to Ithra
September 3, 2018	DGS Technical Luncheon with Maria Angela Capello – Kuwait Oil Company Executive Advisor
September 3, 2018	SEG Women Network Committee with Maria Angela Capello – Kuwait Oil Company Executive Advisor
October 8, 2018	DGS October Dinner Meeting with Didier Houssin Chairman and CEO, IFP Energies Nouvelles "Oil and Gas in the Energy Transition: The Role of Research and innovation"
October 25, 2018	DGS Technical Luncheon with Ronald J. Steel – Professor and Davis Chair, University of Texas, Austin "Sequence Stratigraphy: It is changing"
November 6, 2018	2018 Distinguished Instructor Short Course with Kurt Marfurt - Frank and Henrietta Schultz Professor of Geophysics at University of Oklahoma "Seismic Attributes as the Framework for Data Integration throughout the Oilfield Life Cycle"
November 12-15, 2018	Exploration Organization high-school visits
November 27, 2018	DGS-Workshop: Attribute-Assisted Grid Smoothing
December 4, 2018	DGS December Dinner Meeting with Denise Cox, 2018-2019 AAPG President and President of Storm Energy Ltd. "Big Data"
December 4, 2018	Young Professionals Challenges and Opportunities by Denise Cox, 2018-2019 AAPG President and President of Storm Energy Ltd.
December 5, 2018	DGS Technical Luncheon with Abdullah Mah – Senior Remote Sensing Specialist, Saudi Aramco "Remote Sensing for Oil and Gas"
December 22, 2018	DGS Al-Hasa Safari Trip: An Adventure to the Yellow Lake
Januray 19, 2019	DGS Al-Hasa Heritage Tour
January 21-23, 2019	EAGE/DGS Jurassic Field Trip

Date	Event
January 30, 2019	DGS Technical Luncheon with Jerry L. Jensen – Emeritus Professor, University of Calgary, Alberta "Identifying and Exploiting Geological Controls on Interwell Communication"
February 3-7, 2019	The 2019 DGS Distinguished Lecturer Program with Dr. Mahdi Almutlaq
February 13, 2019	Young Professionals Event: Saudi Aramco Corporate Strategy
February 16, 2019	Land Seismic Acquisition Field Trip
February 27, 2019	DGS February Dinner Meeting with Robert R. Stewart 2018-2019 SEG President "Where is Exploration Geoscience Going?"
February 28, 2019	DGS Technical Luncheon with Atanu Basu – CEO and President, Ayata "How would Google Drill? Learning from AI Advances by Tech Pioneers"
March 17-18, 2019	SEG/DGS Workshop Near Surface Modeling and Imaging Workshop
March 20, 2019	DGS Volunteering and Social Outreach Program: A visit to the Pediatric Oncology Clinic at KFSH to celebrate the 2019 International Day of Happiness
March 21, 2019	DGS Outcrop Photo Contest
March 22, 2019	DGS Annual Family Festival
April 3, 2019	DGS April Dinner Meeting with Michael Poppelreiter 2019 EAGE President "EAGE Vision 2025: Building the Most Innovative Geoscience Association"
April 11, 2019	DGS Technical Luncheon with Joseph Mathew, JV Support & Financial Consulting Department at Saudi Aramco " Extracting Value in Oil and Gas Companies"
April 20, 2019	DGS Volunteering and Social Outreach Program: A trip to Ithra for kids with Cancer
May 8, 2019	DGS Volunteering and Social Outreach Program: the DGS Ramadan Food Basket Campaign

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