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## The Oil Drop e-Newsletter

Issue # 4

21 June 2017

An electronic newsletter designed to update members with the latest news and events of the society and to raise technical and professional awareness.

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### DGS 30th Anniversary Dinner



## ANNIVERSARY

On the Half-moon beach near Dhahran, Saudi Arabia, a group of enthusiastic young geologists realized the importance of having a platform to share technical ideas and promote professional development in the local oil and gas exploration community. In the year 1987, a non-profit organization was established with the name of Dhahran Geological Society. DGS founders and many others have worked relentlessly to pursue their vision and accomplish the society's mission.

On Monday, January 11, 1988, the first dinner meeting was held in the Ramada Hotel, which is a continuing tradition until today. Later on, the first publication of the Oil drop was released on June 1990. DGS also co-sponsored the GeoArabia publication. Shortly after, DGS became affiliated with American Association of Petroleum Geologist (AAPG). As a part of professional development, the DGS jointly started organizing conferences with other professional organizations. One example is the co-hosting role of the GEO. Along the years, the DGS booth has been always an integral part of the exhibition at the GEO, spreading the word of Geoscience to professionals and students. In 1998, DGS sought the importance of transforming to a multidisciplinary organization to encompass geology, geophysics and related sciences, when DGS became known as the Dhahran Geoscience Society. Shortly after, DGS became affiliated with the society of Exploration Geophysicists (SEG) and the European Association of Geoscientists and Engineers (EAGE).

Since the beginning of DGS, activities to the members never stopped which included, dinner meetings, technical luncheons, courses, workshops, and distinguished programs. One of the DGS highlighted activities are their local and global field trips visiting many destinations. DGS has always been fueled by the youth



guided and empowered by the experienced, which is where young professionals established their own section in 2013 leading to whole transformation in the DGS and the change of its Logo. This year marks the 30th anniversary of DGS, where we reaffirm our promise to the Geoscience community by delivering variety of activities aligned with the founders’ vision and mission. From field trips, to technical luncheons to dinner meetings. Today, we are continuing the excellence and moving toward the vision with firm steps. Happy 30th anniversary to the DGS Community.

As the most prominent activity of DGS throughout the year, DGS held a highlight event to commemorate its 30th anniversary where young professionals gathered their efforts with DGS members in a cooperative manner to make it happen. Through the 30th anniversary event, DGS celebrated the success of previous achievements, aiming for continuity through to next generations. A traditional Arabic Dance was performed by a group of Saudi performers. Their local Arabian proud customs with their shiny swords sure did steal the lights for a while. The performance was followed with the opening remarks by Yara Garoot welcoming DGS guests and members.

The DGS president gave a speech that started by thanking both management and young volunteers that helped DGS accomplish a successful term. Followed by a short video with an Arabic poem that was projected through a large display screen. The poet was composed specifically for DGS by a young member, Zakiah Al Khadrawe where she managed to marry both Arabic poetry and the exploration journey. Another exceptional video made by DGS young professionals was shown where it covered DGS achievements and memorable moments. The video presented a timeline with some pictures that highlighted the story of DGS since launch all the way through 30 years.

Finally, Mr. Ibraheem Assa’adan, Saudi ARAMCO’s VP of exploration, who was the keynote speaker and the guest of honor, gave a remarkable presentation. He shared his vision for the oil industry under the effect of other parallel industries. His talk was titled “From Peak Oil to Peak Demand, The Role of Geoscience”. He also, complemented DGS efforts over the years and specifically for this term. The VP concluded his talk by remembering Abdullah Al-Naim and his huge contributions to the company. Finally, as a token of appreciation, DGS ex-presidents were awarded with trophies to thank them for their presence and tremendous contributions. Then, a group photo was taken to be added to DGS portfolio.



### Technical Luncheon Meetings

Local and world-renowned scientists and professionals are regularly invited to present their work at DGS events as part of the society’s mission to expand the knowledge of its members in the geosciences. Eleven technical meetings held over the past year have opened the minds of the many attendees to a wide variety of exciting topics, from time-lapse full waveform inversion (FWI) through to new insights on the comparison between fractures in carbonate ramps versus those of flat-topped platforms.

DGS has organized a technical Luncheon on 26th April 2017 featuring one of the leading experts in Carbonate Sedimentology, Prof. John Reijmer. Prof. John is the Saudi Aramco Chair professor in the new College of Petroleum Engineering and Geosciences (CPG). In his talk, he gave new insights on the comparison between fractures in carbonate ramps versus those of flat-topped platforms. Prof. John Has an impressive career which includes working as a full professor in carbonate sedimentology and marine geology in Vrije university in Amsterdam and he occupied part-time professorship at Delft University of Technology for six years before



joining CPG in 2016. Prof. John received his BS and MS degrees in Sedimentology and Stratigraphy from University of Amsterdam in 1984. He then received his Ph.D. from Vrije university in Amsterdam. Luncheon was concluded by awarding Prof. John for his informative talk by DGS president, Mr. Mohammed Al Hussain, followed by a delicious buffet lunch.



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## First DGS/RCD Reservoir Characterization Workshop



On 1-2 May 2017, DGS in collaboration with Reservoir Characterization organized a two day workshop at the Technical Exchange Center in Dhahran. This workshop was an interactive event where presenters and attendees were invited to share and discuss tools and techniques in 1D, 2D and 3D modeling. The workshop included three main technical sessions: 1D Modeling, 2D Modeling and 3D Modeling followed by a Workshop Wrap-up and Way Forward session. The participants took away a clearer idea of how much Saudi Aramco's reservoir characterization has advanced and how new ideas and technologies can be leveraged to build fully stacked, fully integrated and fully iterative 3D geological models that are robust and reliable.

Reservoir characterization is about the comprehensive understanding and visualization of reservoir properties at initial reservoir conditions using geological, geophysical, petrophysical and reservoir engineering data through descriptive and quantitative models. The final product is a predictive 3D numerical earth model of the subsurface that encompass most, if not all, of the available data and their interpretation for the reservoir and overlaying units. This model has best accounting of original hydrocarbon in place and will be utilized to optimize well placement to achieve production targets, present and future.

In the past few years, significant breakthroughs were made in Saudi Aramco's reservoir characterization, a key significant development was in the introduction of the 1D, 2D and 3D modeling concepts. The one-dimensional (1D) modeling drives stratigraphy, structural, and Petrophysical interpretations from data at well locations. Two-dimensional (2D) modeling drives structure and stratigraphy as maps and cross-sections that are built on 1D modeling results. The three-dimensional (3D) modeling builds the reservoir properties of depositional facies, structural components, seismic attributes and the ultimate product; the 3D petrophysical model.

The geophysical reservoir characterization workflow, quantitative seismic interpretation and modeling (QSIM), has 1D, 2D and 3D modeling segments. This unique workflow was developed specifically to meet Saudi Aramco's requirements. Between these three modeling stages, there are many iterative steps. Because some of the intermediate workflow outputs are stand-alone products as well as inputs to subsequent stages along the path of the workflow.

Workshop committee: Mohammed Khalifa, Marwan Thagafy and Mohammed Alhussain  
Organizing Committee: Abdullah M Albarrak, Ali H Rabaan, Faris M Awam, Mohammed Alabkari, Mohammed Benalshaikh, Mohammed Ghallab, Nujoud Garoot and Wadyan Ayyad.





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## EAGE Education Tour : “Full Waveform Inversion: Where are the Anisotropic Parameters Hiding?” by Prof. Tariq Al-Khalifah, KAUST

On 23<sup>rd</sup> April 2017, In collaboration with EAGE, DGS organized the EAGE Education Tour short course given by Prof. Tariq Alkhalifah at Carleton Al Moaibed Hotel in Al-Khobar.

Professor Alkhalifah’s research interests are in imaging and velocity model building for seismic data exploration with special emphasis on media that exhibit anisotropic behaviors of wave propagation. He is also interested in seismic acquisition and processing of near surface data for better near surface treatment.

The course started by introducing the fundamentals of full waveform inversion (FWI) starting from its basic definition. It soon focused on the model update issues and provided analysis of its probable success in converging to a plausible model. During the course, many challenges faced in applying FWI on seismic data were discussed, and modern day proposed solutions to these challenges were introduced. The focus of the course was on FWI applied to anisotropic media. Additionally, the course also anisotropic optimal parameterization and wavefield simulation in such media. Furthermore, practical multi parameter inversion for anisotropic parameters requires an optimal FWI setup. Such a setup was discussed in the course, including the proper parameterization of the medium and data access scheme necessary for a potential convergence to a plausible anisotropic model.



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## Innovation Challenge Awards Ceremony





*The winning team*

During the closing ceremony of DGS Innovation Challenge, teams got the chance to present their proposed solutions to Exploration management and a wide audience from different disciplines in exploration. The ceremony began by opening remarks from the Vice President of Exploration, Mr. Ibrahim Assa'adan, followed by remarks from the manager of EXPEC ARC, Mr. Ali Meshari, and then all teams presented their proposals. The judging panel consisted of: Mr. Abdelfattah Bekhit from Eastern Area Exploration Department, Mr. Chris Ayadiuno from EXPEC ARC, and Mr. Mahdi Al Mutlaq from the SPOT team in Exploration. After all teams have presented, the general manager of Exploration, Mr. Misfer Alzahrani, shared few encouraging comments about the efforts and approaches, and how to move forward to implement these approaches in the Exploration Organization.

The winning team was team number 6, who consisted of Jose Johnson, Mohammed Arfaj, and Zaid Musallam, and their challenge was to improve communication channels between service departments and proponents to provide desired products and proper feedback. Here is what the team have shared about their challenge: "To us, our challenge was intriguing and intimidating at the same time. It was intriguing due to its potential in transforming the way we work and communicate; and Intimidating because of its sheer scale and magnitude. However, we decided to tackle it head on since we had nothing to lose. This is what we liked about the DGS YP Innovation Challenge. A young professional has much to gain with little (nearly nothing) to lose. We gained, among many lessons, real-life experience solving big problems and exposure to several aspects of the business. All for the price of three months of our own time. A wise investment if you ask us."

The Team has also added: "We began by rephrasing it as a question because of the positive effects of questions on focus and productivity. We gleaned from the original text of the question the four main aspects that we want to improve in our work: agility, efficiency, quality and innovation. Our breakthrough came early when we decided to look at Exploration in its simplest form, a business like any other, delivering value to customers. This meant that the challenge was not unique to us. This allowed us to search the literature for success stories in overcoming such a challenge. We combined that with root cause analysis and in-depth interviews to get a better understanding of the challenge and potential solutions. Our solution is two-fold: (a) product teams, enabled by (b) an online integrated collaboration platform (GLUE). The product team concept was inspired by Toyota. We then use the advent of technology to have an online platform, GLUE, as the enabler for the product teammates to collaborate without the need for restructuring."

The DGS-Innovation challenge committee and participants of the innovation challenge would like to show their gratitude to the leadership at the Exploration organization and EXPEC ARC for sponsoring this invaluable opportunity to tackle such critical challenges, and we look forward for more similar initiatives.



*Innovation challenge participating teams.*

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**Morocco Geological Tour : Led by Yasmina Kechida, Geologist, Saudi Aramco**





DGS Morocco geological tour was uniquely special because it combined one of the most geologically diverse places on earth, rocks and tectonics ranging from Precambrian to Recent, with a fascinating human history of world heritage significance in terms of archeology sites and monuments from Roman and medieval times, extending to the present day.

A group of over forty enthusiastic geoscientists and non-geoscientists united by their love of adventure, they started their journey in Marrakesh directly in the heart of Morocco where they were led by a geological guide, Professor Hassan Ouanaimi from the ENS of Marrakesh. A specialist on the geology of the high Atlas, his areas of expertise includes tectonics, sedimentology, sequence stratigraphy and geological mapping. The group’s journey through the high Atlas mountain range enabled them to investigate the Triassic synrift sequence, the early Jurassic cover detachment in the northern Subatlantic Zone, the Ordovician to Devonian sequences of the Paleozoic inlier and the Cambrian-Ordovician Boundary (Figure 1: Black Itinerary).

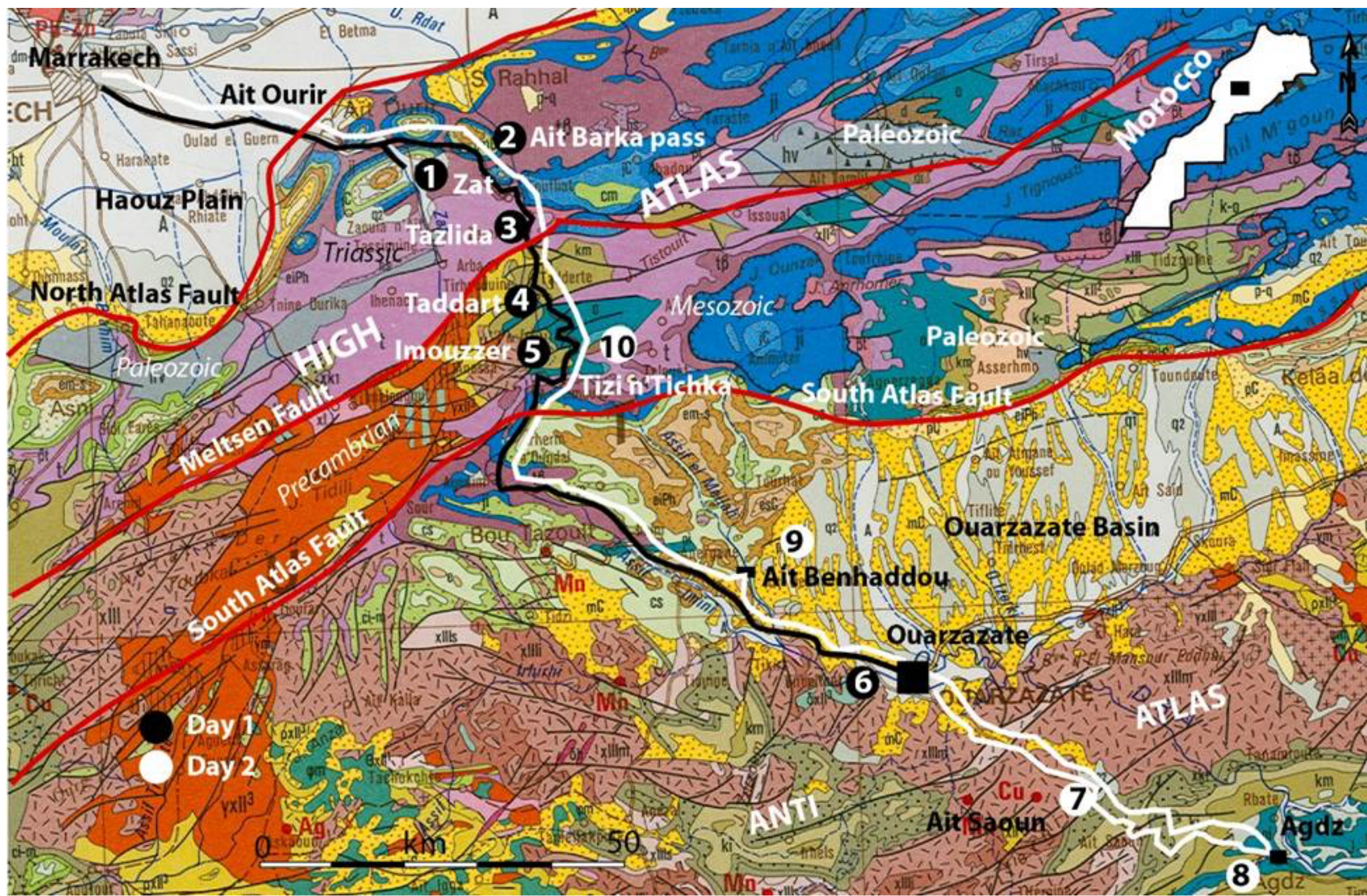
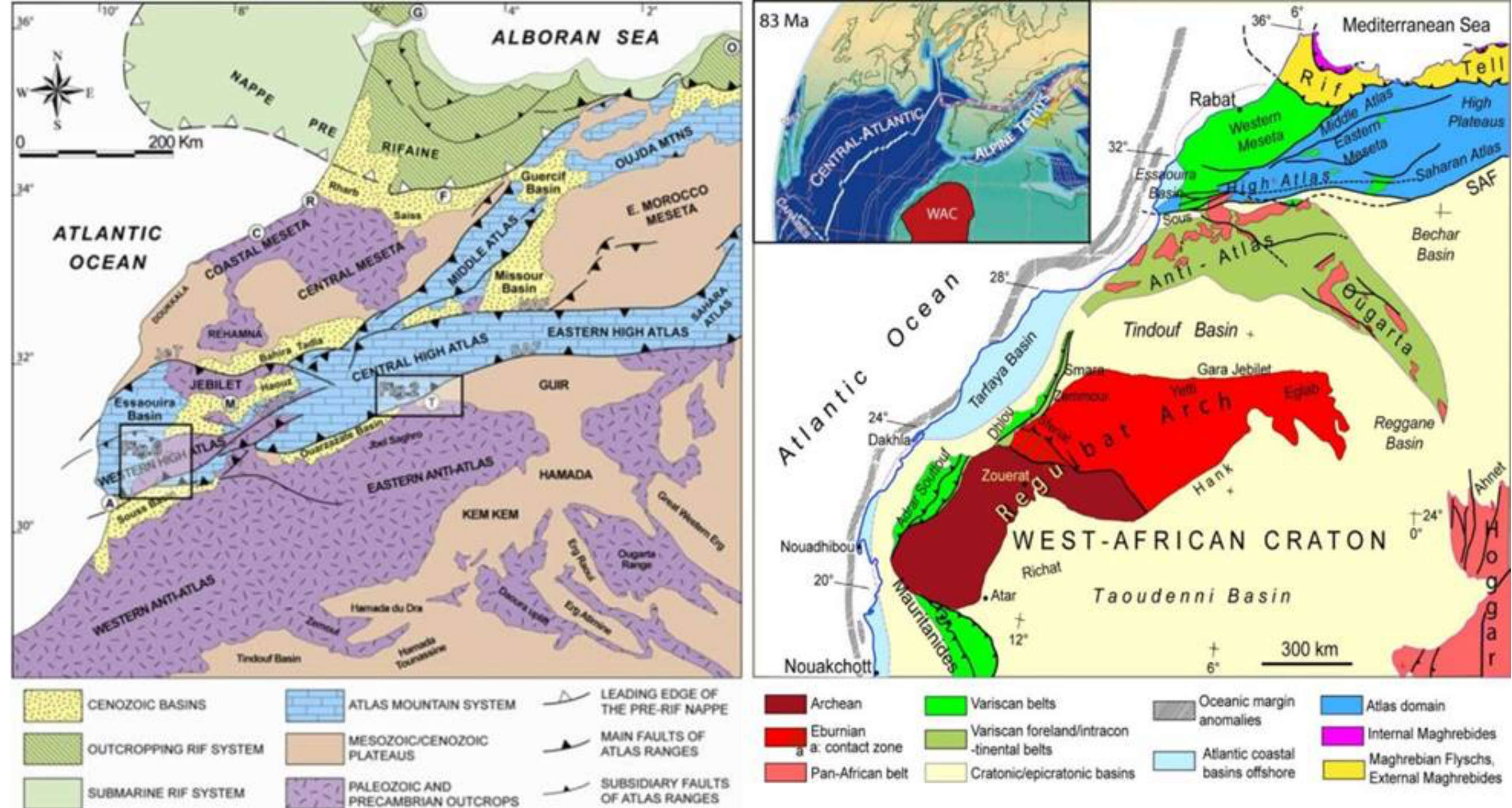


Figure 1: Geological traverse across the High Atlas from Marrakesh to Ouarzazate (Black is geo-itinerary)

Morocco is a mobile zone located at the northern western part of the west African Craton, marked first by the Atlantic Ocean opening and second by the Africa-European collision (Cenozoic: Compressional event). This event is linked to the formation of the Alps commencing 60 million years ago. The collision of Africa and Europe released tectonic stress and created significant deformation in Morocco. The high Atlas represents the highest mountain chain in Morocco crossing the country in a SW-NE trend and extending for 2000 kilometers from the Atlantic Ocean to Algeria with 800 kilometers of range in Morocco. The high Atlas fold and thrust belt were formed by the Pre-Cambrian and Paleozoic basement and a Mesozoic-Cenozoic succession characterized by a tectonic contact due to the cover detachment in two opposite directions towards south and north (Figure 2: General Geology).





The Mesozoic succession started with Late Triassic (Carnian) red beds, comprising conglomerates, sandstones, siltstones and mudstones, and resting unconformably on the top of the Lower Paleozoic rocks and Pre-Cambrian basement (Figure 3: Pass of Ait Barka).

The overlying limestones and dolomites represent the transgressive early Jurassic (Liassic) platform succession of marls and limestones indicating the start of a passage from basin to platform, emergence of the platform and the formation of the Cenozoic basin, in a progradational event.

Visiting the medieval cities of Morocco is like travelling back in time, the picture has not changed in a thousand years. The craftsmen and artists of Morocco today still follow the methods and techniques of their ancestors maintaining the authenticity of their products. A civilization preserving their know how for future generations. Even the food was authentically amazing, with a variety of flavours. Everywhere the group went, people generously offered delicious mint tea drinks. The authenticity of Morocco is found everywhere from the deserts and mountains to the coastal areas. Each place taught the group a different part of the rich geological and cultural history of this amazing country.

Reference:  
Structural Geological Analysis of the High Atlas (Morocco): Evidences of a Transpressional Fold-Thrust Belt: By Alessandro Ellero, Giuseppe Ottria, Marco G. Malusà and Hassan Ouanaimi. DOI: 10.5772/50071



Figure 3: Synclinal formation: detachment of the Mesozoic Cover - Jurassic and Cretaceous on top of the Triassic at Ait Barka Pass. In the background the Liassic platform where the delineation of the Marrakesh Basin commenced (flat area) (Cenozoic Basin). Stop number 2.

## YP Occupational Therapy Event





On 22<sup>nd</sup> March, DGS young professionals section organized a health oriented event at EXPEC Auditorium. DGS hosted the Premium OTs Group which is considered one of the specialized groups in the field of occupational therapy founded in April 2016 with a total of 68 members. Their vision is to raise the level of services, enhance the independence and quality of lives in addition to increasing the interaction between occupational therapy professionals locally and globally. Their mission is to activate the role of the therapists and support them with their development regarding further specializations and career paths. Occupational therapy is a client-centered health profession concerned with promoting health and wellbeing while working. After introducing themselves, occupational therapy group shared several examples or cases that can be treated by occupational therapists among which Neurological disorders, such as: cerebrovascular accidents, traumatic brain injuries, multiple sclerosis, Parkinson's disease and cerebral palsy. In addition to that, they also can look into nerve injuries, such as: spinal cord, peripheral nerve and hand injuries, such as: post-tendon repair surgeries and hand fractures. Therapists can also attend to pediatric developmental delays, autism, attention deficit hyper-activity deficiency (ADHD) and learning disorders, burn & scar management, some psychiatric disorders, such as: schizophrenia, mood disorders and can even help normal people have a healthier physical lives. The group then introduced the concept of ergonomics. The term Ergonomics consists of two words: Ergo meaning work and nomics meaning laws or rules. It was defined by Occupational Safety & Health administration (OSHA) as the science of designing the physical job to fit the worker, instead of forcing the worker to fit the job. Ergonomics can reduce work related Musculoskeletal disorders and work related stress. Work-Related Musculoskeletal Disorders are a group of painful disorders of muscles, tendons, and nerves. The hosted therapists shared statistics of the most common disorders and how to avoid being affected by one by paying attention to three main things being: proper posture or body positioning, forces management and repetitive motions.

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## DGS 2016-2017: A Year of Accomplishments

As the 2016-2017 DGS term has come to an end, we would like to share with you highlights of the accomplishments achieved during this term. These achievements would not have been accomplished without the dedication of our members and young professionals who contributed in many different ways to bring DGS activities to new unprecedented levels. We would like to extend our sincere gratitude to our volunteers for their endless hard work; our sponsors for their generosity; and the utmost appreciation goes to Saudi Aramco's Exploration Organization for their continuous support that fueled all of our success stories.





Mohammed Alhussain  
DGS President



Abdulaziz Almuheidib  
President-Elect



Mohammed Duhailan  
Vice President



Mohammed Abu Alnas  
Treasurer



Imran Abdul Rauf  
Webmaster



Mai Al-Mansour  
Membership Liaison



Hussain Qattan  
Student Section  
Liaison



Emad Al-Hemyari  
Publication Officer



Musab Modrra  
Professional Meetings  
Officer



Yasmina Kechida  
Field Trip Officer



Fawwaz Khaldi  
Professional Development  
Officer



Maha Al-Suwaidi  
Secretary



Yara Garoot  
Young Professionals  
Officer

## Accomplishments





### End of Term Recognition



### DGS 2017-2018 Elected Executive Committee

Dhahran Geoscience Society (DGS) is pleased to announce the election results. The new DGS Executive Committee members are:

Title	Name
President	Abdulaziz Al Muhaidib
President-Elect	Mohammed Al Duhailan
Vice President	Khalaf Al Temimi
Professional Development Officer	Musab Al Modrra
Young Professional Officer	Salma Al Sinan
Secretary	Soaad Al Enazi
Student Section Liaison	Firas Al Awam
Publications Officer	Fabian Duque
Field Trip Officer	Yasmina Kechida
Professional Meetings Officer	Aun Al Ghaithi
Webmaster	Nasher Al BinHassan
Treasurer	Mohammed Bin Gubair
Membership Liaison	Emad Al Hemyari





Since its inception in 1987, DGS has enriched its members with knowledge. DGS organized many events that facilitated continued growth among its members and young professionals. And since the first publication of the Oil drop was released on June 1990, more publications kept being released till this day. The last four releases of the Oil Drop were in the form of an e-newsletter, a more sustainable and environmentally friendly form. At the end of 2016/2017 term, DGS publication committee would like to thank its contributors and loyal followers for their continuous support and constructive comments.

## Membership Update

Membership of the Dhahran Geoscience Society is open to all Eastern Province geoscientists. The Dhahran Geoscience Society is an affiliated society of AAPG, EAGE & SEG. If you are interested in joining DGS, please complete the online application form at <http://dgsonline.org/register>. If you are already registered, please update your contact information at <http://dgsonline.org/profile>. For more enquiries about membership, please contact the membership liaison:

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## Upcoming Events, Announcements & Important Dates

EAGE President Dinner Meeting	17 September 2017
North of Ireland Tour	22 June – 1 July 2017

## Gold Sponsors



## Affiliations



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