



January 2021

# SandRose

## Magazine

*Amira AlKaabi*



Kingdom of Saudi Arabia Section

at the  
**HEART**



# CONTRIBUTORS

## DECEMBER 2020 EDITION

**EDITOR-IN-CHIEF**  
Hala AlHashmi

**EDITORIAL ADVISOR**  
Salma Al-Hashimi

**CREATIVE ADVISOR**  
Anas Ruhman

**ASSISTANT EDITOR**  
Sarah Alruwaily

**SENIOR EDITORS**  
Ali Al Towilib  
Reem Alsadoun  
Hala Alwagdani  
Yazeed AlDughaither

**ASSOCIATE EDITORS**  
Yara Alzahid  
Mustafa Alkhowaildi

**CONTRIBUTORS**  
Nouf Alotaibi  
Mohamed Alsomali

**GRAPHIC DESIGNER**  
Sara Sami

 [behance.com/sarasami](https://www.behance.com/sarasami)

**COVER DESIGN ARTIST**  
Amira Alkaabi

 [alkaabiamira](https://www.instagram.com/alkaabiamira)

 [Alkaabi.Amira.a@gmail.com](mailto:Alkaabi.Amira.a@gmail.com)



**FOLLOW US ON SOCIAL MEDIA!**



**Twitter:** @spe\_ksa



**Instagram:** @spe\_ksa



**LinkedIn:** SPE – Kingdom of Saudi Arabia Section



**Snapchat:** Scan below for an instant add!



**DOWNLOAD OUR APP**

using this QR code to enjoy our Augmented Reality feature for the upcoming editions and to gain access to events, photo galleries, membership information and all SandRose publications:



**CHECK OUT THE DIGITAL VERSIONS OF THIS EDITION OF SANDROSE USING THE QR CODES BELOW!**

<https://spe-ksa.org/>



PDF Articles



Online Version

**We want to hear from you.**

To contribute in future editions, or share with us your feedback, please reach us on:  
[sandrose@spe-ksa.org](mailto:sandrose@spe-ksa.org)

**NEW  
FEATURE!**

**SHARE YOUR FAVORITE PIECES  
BY SCANNING THE QR CODES  
ACCOMPANYING EACH ARTICLE  
AND FEATURE!**

**04** Message from the  
Editor-in-Chief

**05** Meet the  
SandRose Team

**06** Message from  
the Chairman

**07** Meet the SPE-KSA  
Executive Board



**08** The Chemists' Club  
Kavaler Award

**09** Lifetime Achievement  
Award

**10** Webinar on Human  
Factors Integration  
into O&G

**11** Webinar on Life  
in the Subsurface &  
Distinguished Lecturer  
Session on Old Logs

**12** The Week of Action

**13** YOU 2.0

**16** Energy4Me Training  
in the UAE &  
Outreach to High  
School Students

**17** Al-Asala University  
Awareness Session  
& KFU Awareness  
Session



**18** KSU Awareness  
Session &  
PSU Awareness  
Session

**19** YOU 2.0:  
Student Edition

**20** Renovation of  
Underprivileged  
Homes &  
Honoring of  
T&SA Volunteers

**21** KSA Second Cross  
Country Race

**22** Wall Painting of Ifaa  
Organization

**23** Blood Donation  
Campaign &  
Cycling Basic Group  
Training

**26** Tertiary Recovery

**28** Seeing is Believing



**32** The Surface Logging  
Advantage

**34** Art & Technology

**36** Sleep Deprivation

**41** Book  
Recommendations

# MESSAGE FROM THE EDITOR-IN-CHIEF

I am honored and truly proud to present you with this edition of SandRose Magazine, which marks the 6th for our 2019-2021 term. The SandRose team, for the most part, has remained consistent since the beginning of our term that began in July of 2019. At the start of this message, I would like to thank all SandRose team members, past and present, for their hard work and dedication. Their efforts are a true testament to the integrity and sophistication that SPE-KSA members possess.

With this edition, we wrap up the year 2020, and what a journey it's been. Although this year has knocked us down several times, it has taught us many lessons – lessons that we would not have learned otherwise. As a society, 2020 has pushed us to explore new arenas and platforms of communication. SPE-KSA was well-known for its physical gatherings and get-togethers, and all of that came to a deafening halt at the beginning of the pandemic. Nevertheless, all of the SPE-KSA teams persevered one way or another and achieved their goals and ambitions.

The Technical Programs team launched and carried through sessions for its Webinar Series and Virtual Distinguished Lecturer Program, a few of which are highlighted in this edition. The Young Professionals team carried through its YOU 2.0 program and launched the "Week of Action". The Student Outreach team continued to host virtual university sessions and school sessions to introduce students to SPE and the world of Oil & Gas. They have also collaborated with the YP team on YOU 2.0 and continued with programs such as Energy4Me. The Trips & Social Activities team continued to actively contribute to the community through volunteering activities, health and well-being initiatives and overall positive impact participations.

Every edition of SandRose is unique, and this edition is no different as it celebrates several successes on different fronts. First, we celebrate Amin Nasser's honoring as the recipient of the Chemists' Club Kavalier Award and Dawood Al-Dawood's honoring as the recipient of the Lifetime Achievement Award. Additionally, this edition highlights the KFUPM SPE Student Chapter in its achievement of the 25-Year Milestone Anniversary. Atop highlighting achievements, SandRose is proud to serve as a platform for contributing authors. In this edition, you will find technical and non-technical articles on tertiary recovery, downhole cameras, surface logging, art & technology and sleep deprivation, in addition to our usual book recommendations piece.

As we begin the new year, it's important to remember that we all experienced the year 2020 differently. Let us not be too hard on ourselves, or on each other, and let's make 2021 a year of celebrating "small wins" rather than waiting for major victories.

**HALA A. ALHASHMI**  
Editor-in-Chief



# MEET THE SANDROSE TEAM



**Salma Al-Hashimi**  
Chief Editor Advisor



**Anas Ruhman**  
Creative Advisor



**Sarah Alruwaily**  
Assistant Editor



**Ammar Siddiqui**  
Senior Editor



**Fatemah Abudeeb**  
Senior Editor



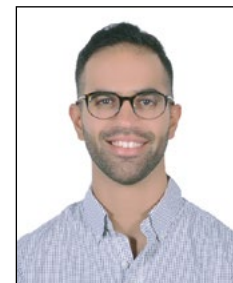
**Ali Al Towilib**  
Senior Editor



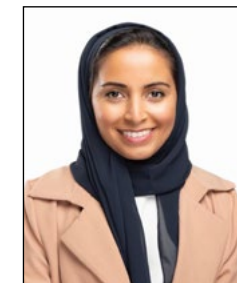
**Reem Alsadoun**  
Senior Editor



**Hala Alwagdani**  
Senior Editor



**Yazeed Al Dughaiter**  
Senior Editor



**Yara Alzahid**  
Associate Editor



**Norah Al Sunaidi**  
Associate Editor



**Mustafa Alkhowaildi**  
Associate Editor



**Malikah Sharif**  
Contributor



**Nouf Alotaibi**  
Contributor





# MESSAGE FROM THE CHAIRMAN

The SPE-KSA Executive Board wishes all of its community members a successful, joyful and memorable 2021.

As 2020 wraps up, the section looks at the past year with pride, as it has maintained momentum in overcoming difficult circumstances and turning challenges into opportunities. Throughout the year, SPE-KSA has successfully transitioned to virtually conducting its activities, whether it be through online seminars, workshops and sessions.

Our number one priority remains to introduce our community, from students to professionals, to the world of energy. We have also continued to focus on expanding our reach and broadening our members' horizons by bringing them closer to the industry's hot topics. Fortunately, and with the necessary precautions, we are getting back on track when it comes to our physical engagements and participation in the community. Although the pandemic has slowed down physical engagements, it has propelled us towards exploring new, innovative methods of engagement - ones that we will continue to utilize to further expand our reach to the local and global communities.

We invite you to join our community and stay updated with our upcoming activities through our website and social media channels. We also continue to welcome recommendations and suggestions for new programs and initiatives on our email: [suggestions@spe-ksa.org](mailto:suggestions@spe-ksa.org).

We look forward to your contributions to the section and its community.

**ABDULAZIZ K. AL SUFAYAN**  
Chairman, SPE-KSA



# SPE-KSA 2020-2021 EXECUTIVE BOARD



**Dr. Mohammed Al-Hamdan**  
ATS&E Chairperson



**Nassir Abalkhail**  
Technical Programs Chairperson



**Mohammed Al-Nahas**  
Young Professionals Chairperson



**Seba Al-Maghlouth**  
Student Outreach Chairperson



**Mohammed Al-Mishkhas**  
Trips & Social Activities Chairperson



**Othman Al-Qasim**  
Membership Chairperson



**Abdulrahman Al-Naim**  
Informational Technology Chairperson



**Hala Al-Hashmi**  
SandRose Editor-in-Chief



**Saad Al-Mudara**  
Treasurer



**Abdullah Al-Mulhim**  
Event Management Chairperson



**Abdulrahman Al-Musare**  
Planning & Coordination Chairperson



**Abdulaziz Al-Suwailem**  
Public Relations Chairperson

## JOIN SPE-KSA FAMILY NOW!

SPE-KSA section is considered one of the largest and most decorated SPE sections in the world with more than 10,500 members.

For more information about how to join SPE-KSA family, visit [spe-ksa.org/membership/](https://spe-ksa.org/membership/)



CONGRATULATIONS TO  
**AMIN H. NASSER**  
President & CEO of Saudi Aramco



## THE CHEMISTS' CLUB KAVALER AWARD

The Chemists' Club was founded in 1898 by a group of individuals from the United States who studied Chemistry in Berlin, Germany. The club's goal is to promote the interests of chemists and those interested in the science and applications of chemistry by providing academics and industrial chemists with a space to meet, work, and study. Until today, the Chemists' Club helps students, young professionals and industry professionals.

The Chemists' Club Kavalier Award is given each year to a senior executive recognized for outstanding achievement, as voted on by his/her peers. The top 40 power players in the industry are invited to vote for three of their peers based on achievements in the following categories: profitability and shareholder value, ESG, innovation, M&A and special projects.

This year, Saudi Aramco President and CEO, Amin H. Nasser, was given the Kavalier Award for his and Saudi Aramco's outstanding achievements under his stewardship. Nasser was awarded for the major advances Saudi Aramco has made with the \$69Bn acquisition of SABIC, the construction of mega projects worldwide, and the continuous development of crude oil-to-chemicals technologies. As eloquently stated by Dean Curtis, President and CEO of ICIS, "The Company's global ambitions and investments will create waves in the chemical industry for years to come, and never before has this long-term aspiration and vision been so important during this short-term uncertainty."

“I am proud to accept this recognition on behalf of thousands of men and women of Saudi Aramco who are showing great determination and resilience in a year that has been unlike any in our lifetime. This is definitely their award, too. Despite COVID and all its challenges, our work is going on at Aramco. We have continued to pursue our long-term strategy to be a bigger player in chemicals through projects here in the Kingdom and around the world. In fact, the progress we have made is just the beginning of a major transformation, positioning Aramco for the future.”

**AMIN H. NASSER**  
President & CEO, Saudi Aramco



CONGRATULATIONS TO  
**DAWOOD M. AL-DAWOOD**  
Vice President of Northern Area Oil Operations, Saudi Aramco



## LIFETIME ACHIEVEMENT AWARD

The S&P Platts Global Energy Awards recognize and honor organizations and individuals dedicated to excellence in the energy industry. This year's awards mark its 22nd presentation, and is especially significant given the challenging year that has passed. Therefore, the 2020 awards are not only recognizing excellence, but also recognizes winners who did not back down in the face of the unique challenges presented by 2020. The awards drew a record of over 300 nominations from around 43 countries. This is a testament to a resilient industry that lifts each other up even amidst a pandemic.

The Lifetime Achievement Award was awarded to Saudi Aramco's Dawood M. Al-Dawood, who celebrates more than 37 years in managerial, leadership and technological positions within the energy industry and in recognition of Al-Dawood's exemplary leadership, cultivating innovation, stewardship, sustainability and extraordinary performance. Al-Dawood is currently Vice President of Northern Area Oil Operations at Saudi Aramco.

S&P Global Platts is a division of S&P Global (NYSE: SPGI), the leading independent provider of information and benchmark prices for the commodities and energy markets. Established in 1999 and often described as "the Oscars of the energy industry," the Global Energy Awards honor organizations and individuals in the energy industry who are dedicated to achieving excellence.



# APPLICABILITY AND INTEGRATION OF HUMAN PERFORMANCE/HUMAN FACTORS SCIENCE INTO AN OIL & GAS COMPANY

SPE-KSA WEBINAR SERIES



**SERGEY PERESYPKIN**  
Director of HSE for Middle  
East North Africa Turkey  
& India Region  
*Baker Hughes*

On November 18th, 2020, the SPE-KSA Technical & Professional Programs kicked off its webinar series for the 2020-2021 year with a webinar titled, "Applicability and Integration of Human Performance/Human Factors Science into an Oil & Gas Company" by Sergey Peresypkin, Director of HSE for Middle East North Africa Turkey & India Region, Baker Hughes. The webinar was attended by 50 industry professionals interested in learning more about the HSE practices implemented by industry leaders.

In this webinar, Sergey discussed how human factors can impact performance and HSE of oil and gas companies. Sergey also reviewed the different factors impacting job performance, and HSE measures implemented by oil and gas companies. Sergey further discussed how oil and gas professionals and leaders should address the aforementioned to promote higher safety levels, operational efficiency and sustainability.

The webinar was 1 hour long, 15 minutes of which were dedicated to the members' discussion with the speaker to learn more about what they can do to promote HSE efforts within their organizations and lead safe operations.

**Written By:** Nassir A. Abalkhail



**JON TUCK**  
Sr. Production  
Chemistry Advisor,  
*Baker Hughes*



scan to share

# LIFE IN THE SUBSURFACE: UNDERSTANDING HOW MICROBES CAUSE RESERVOIR SOURING, AND HOW TO MANAGE IT

SPE-KSA WEBINAR SERIES

On December 2nd, 2020, the second installment of the SPE-KSA Webinar Series for the year 2020-2021 was presented by Jon Tuck, titled, "Life in the Subsurface: Understanding How Microbes Cause Reservoir Souring, and How to Manage It". The webinar was attended by 45 members with engineering and science backgrounds to learn more about a common phenomenon which occurs in the reservoir, and the available methods to combat and manage it.

In this webinar, Jon discussed how microbes and organisms can react to an increase the reservoirs' souring and mainly the H<sub>2</sub>S presence in the reservoir. Jon discussed the conditions required to promote such reactions and how reservoirs with such level of sourness could impact an oil or gas field's level of complexity. Jon also elaborated on what techniques and methods are available to combat this phenomenon, both at the reservoir and surface levels.

The webinar was 1 hour long, 15 minutes of which were dedicated to the members' discussion with the speaker to learn more about reservoir sourness and the available methods to manage it.

**Written By:** Nassir A. Abalkhail



**RICK ALDRED**  
Consultant  
Petrophysicist



scan to share

# LOOKING AT OLD LOGS IN NEW WAYS: RE-EVALUATING LOW RESISTIVITY INTERVALS IN MATURE FIELDS TO IDENTIFY BY-PASSED PAY

SPE DISTINGUISHED LECTURER PROGRAM

On November 16th, 2020, SPE-KSA, in collaboration with SPE International, kicked-off the SPE Distinguished Lecturer Program (DLP) for the 2020-2021 season. This season is designed to be hosted virtually due to travel the restrictions around the world. The attendance for the first installment of the DLP lectures was around 30 who gathered to listen to Rick Aldred's informative technical presentation about re-evaluating old logs using new tools and methods.

In this webinar, Rick Aldred addressed limitations of old logs and how they can be interpreted using new software and AI. Rick elaborated on a number of methods and techniques to apply new software and algorithm to better understand and analyze old logs, which could reveal more information about reservoirs in their earlier stages and help navigate the way forward.

The webinar was one hour long, 15 minutes of which were dedicated to a live Q&A session during which attendees led an interactive discussion with the speaker regarding some of the issues faced while reinterpreting old logs.

**Written By:** Nassir A. Abalkhail



scan to share



# THE WEEK OF ACTION

Taking Incremental Steps Towards a Sustainable Future

September 25<sup>th</sup> - October 2<sup>nd</sup>

To support the Kingdom's sustainability efforts, the SPE-KSA Young Professionals committee launched the Sustainable Development Goals (SDG) challenge in collaboration with Misk and the Ministry of Economy and Planning (MEP). The one week challenge aims to increase the awareness of young professionals and students about the UN Sustainable Development Goals and motivate them to take actions towards a more sustainable life. The campaign was launched under the slogan of "Every Simple Action Counts" and by adopting small habits in our daily lives, we can transform the world to achieve a better future. The team developed an online competition platform for participants to compete in making the world more sustainable – one action at a time.

In this challenge, 62 participants joined this campaign and took more than 100 actions tackling 15 of the 17 Sustainable Development Goals. The top five participants were recognized for their great efforts during this challenge. The initiative was well received by the Misk and MEP panel of judges, which included regional and international experts and executives in the field of sustainable development including HH Princess Haifa Al Muqrin, Saudi Arabia's Permanent Representative to the UNESCO.

The success of the Week of Action initiative is a testament to SPE-KSA's determination to develop the Kingdom's youth and tackle global challenges with proactive and innovative ideas.

**Written By:** Ziyad AlGhamdi  
SPE-KSA - Week of Action Team Leader



## YOU 2.0 THE POWER SKILLS OF THE FUTURE



The SPE-KSA Young Professionals launched a four-week continuation program (from August 30<sup>th</sup> to October 5<sup>th</sup>) of the "YOU 2.0" virtual education event that was inaugurated back in April of this year. YOU 2.0 highlights the seven essential skills needed by the future workforce to excel in their careers. The participants took a deep dive into the remaining four skills of YOU 2.0. These skills are **Cognitive Flexibility, Hyper-Focus, Personal Branding, and Sales and Persuasion**. A total of 80 participants from twelve different companies and six universities completed a combination of individual tasks, group challenges, and executive training on each skill topic. In addition, participants attended an hour-long weekly coaching sessions with an executive coach to enhance their knowledge and complete interactive group challenges. The program helped better prepare the young professionals and students.

Studies show that by 2030, 65% of us will hold jobs that don't exist, using technologies that haven't been invented, solving problems we didn't even know we had, and some technical skills will be obsolete within five years, on average. Hence, studies show that the seven most essential skills continue to be valued in the future workforce consist of the following:

**Critical Thinking:** The ability to analyze information objectively then make a reasoned and proven judgment.

**Creative Thinking:** The ability to look at problems from a new or fresh perspective that suggests unorthodox solutions.

**Emotional Intelligence:** The ability to be aware of emotions and express them in relationships judiciously and with empathy.

**Cognitive Flexibility:** The ability to switch between two different concepts or multiple concepts at the same time to find the right solution. This is the ability to be mentally flexible and quickly thinking of different ideas and how they may be applicable to any given situation.

**Hyper-Focus:** The ability to center one's attention and create a state or condition that permits clear perception and understanding.

**Personal Branding:** The ability to take control of what other people perceive to be true about us.

**Sales and Persuasion:** The ability to persuade others of the merits of our ideas, solutions and even ourselves.

The "YOU 2.0" program was exclusively offered to SPE-KSA and presented by Steve Brazell, the CEO of Fullbridge and one of the United States' most sought-after brand strategists and reputation crisis managers. The program was kicked off with a special remark from Abdulaziz Al Sufayan, the Chairman of the Executive Board of SPE-KSA. Al Sufayan highlighted the program's importance and encouraged everyone to get the most of it as he enjoyed and learned a lot from the previous run of the program. "This program is a continuation of SPE-KSA's journey to empower its youth and has been heavily praised by our Board of Directors. I urge you all to develop your skills and your networks by connecting to your colleagues, the future of the industry and the Kingdom,"

This program is one of many activities that the Young Professionals team frequently conducts to empower youth and develop their business acumen. The Young Professionals team is currently working on a new program that capitalizes on virtual learning experiences and develops the most sought-after skills by employers around the world.

**Written By:** Ziyad AlGhamdi  
SPE-KSA - Week of Action Team Leader



## Call for Participation

SPE-KSA Young Professionals and Student Outreach teams would like to call on pioneers to join the journey in solving globally prominent ESG (Environmental, Social, and Governance) challenges.

For our 2021 Dynamic Think Tank, participants will join together in teams to strategically solve ESG challenges impacting the energy industry. Our categories are:



### The Circular Carbon Economy:

Reducing carbon footprint through the 4 Rs (Reduce, Reuse, Recycle, and Remove)



### A Resilient Built Environment:

Embracing adaptation to accommodate changes to our ecosystem



### Data Governance in the Digital Age:

Governing and fully securing data while increasing its usage

Application Deadline: January 7, 2021

Endogenous Timeline: January 17 – March 21, 2021



For more information, please visit: <https://endogenous.spe-ksa.org> or scan the QR Code.

## CONGRATULATIONS SPE-KFUPM! 25-year Milestone Anniversary

The King Fahd University of Petroleum and Minerals SPE Student Chapter achieved its 25-year Milestone Anniversary this year. SPE Student Chapters around the world provide an operating framework for all major society activities, thus providing the foundation through which our members can remain engaged. The SPE-KFUPM chapter plays a critical role in member engagement and development, and helps SPE build recognition as a unique world-class professional society.

SPE-KSA celebrates this achievement with utmost pride and will continue to support KFUPM's student chapter, along with other student chapters, in maximizing their potential and achieving their goals.

In celebration of this achievement, the chapter was presented with an official certificate on behalf of the 2021 SPE President, Tom Blasingame, and the CEO and Executive Vice President, Mark Rubin.



King Fahd University  
of Petroleum & Minerals  
SPE Student Chapter




## MILESTONE ANNIVERSARY

The Society of Petroleum Engineers congratulates the

### King Fahd University of Petroleum & Minerals Student Chapter

for 25 years of furthering SPE's mission and supporting local members.

  
TOM BLASINGAME  
2021 SPE President

  
MARK RUBIN  
CEO & Executive VP



## SPE-KSA MEMBERS SUPPORT SPE ENERGY4ME IN A VIRTUAL TRAINING FOR TEACHERS IN THE UAE



scan to share

SPE-KSA members supported SPE International by holding a virtual Energy4Me training session for over 60 science teachers in the UAE on November 30th, 2020. The session aimed to train teachers to perform experiments pertaining to the petroleum Upstream cycle in order to enhance their understanding of oil and gas.

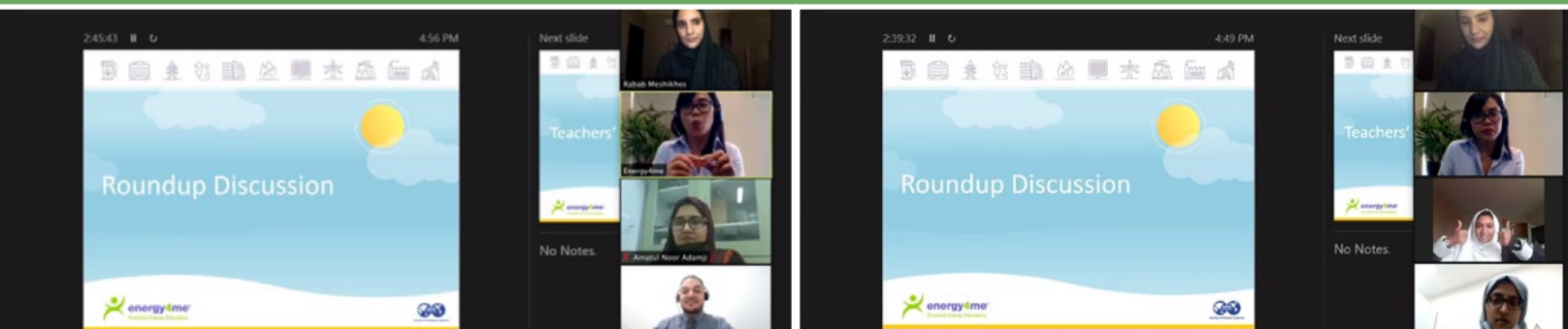
SPE-KSA member, Rabab Al-Meshikhes, addressed the audience with a presentation titled "Let's Talk Energy, Oil and Natural Gas". The talk highlighted the significance of the Oil & Gas industry in the energy sector, and corrected some of the misconceptions about the industry.

The session was then followed by the experiment training,

which was co-held by SPE-KSA members Zainab Alsaihati and Bayan Wasfi, who addressed primary and secondary school teachers. The experiments ranged from explaining how core sampling is performed to exploring natural oil seeps, which over 20 SPE-KSA members were trained to conduct back in 2019 after being trained by Ms. Lou Rodriguez from SPE International.

This collaboration is the fourth of its kind since January 2020, where SPE-KSA members played a major role in supporting Energy4Me through addressing and training teachers locally in the IPTC, and across Europe and Ghana via Zoom.

**Written By:** Rabab Al-Meshikhes



## STUDENT OUTREACH TO HIGH SCHOOL STUDENTS

**SPE members share their experiences with high school students**

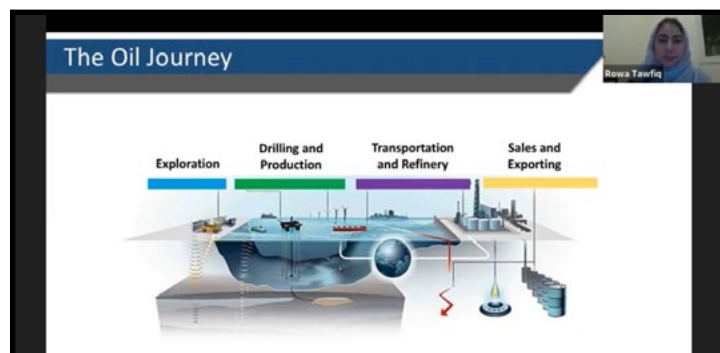


scan to share

During the month of November, the Student Outreach team has been able to adapt to the new norm and continued to spread knowledge about the energy industry and role of petroleum engineers via virtual sessions. The Student outreach team, along with SPE-KSA volunteers, conducted 4 sessions with the College Preparatory Program, Dhahran Ahliya Schools in Dhahran, AlBassam Schools in Dammam, and Al-Anjal Schools in Al-Ahsaa.

great questions were shared and answered in the call and through the chat box.

**Written By:** Layal AlHussain



Overall, more than 500 high school students attended the sessions. The students were enthusiastic and excited to learn about the future of the energy industry, and many

## SPE-KSA: UNIVERSITY AWARENESS SESSIONS

### SPE AL-ASALA UNIVERSITY AWARENESS SESSION

**DR. MOHAMMED GRONFULA & DR. SAMEER AKBAR**

Dean of College of Engineering, and SPE Faculty Advisor at Al-Asala

A virtual interactive session was conducted on November 16th, 2020, through Zoom with Al-Asala University students. The purpose of the session was to introduce students to SPE and to present to students the various benefits and opportunities SPE has to offer. Over eighty (80) students attended the presentation along with the Dean of College of Engineering.

An important goal of the Student Outreach is to bridge the gap between students and professionals, by encompassing a larger audience to benefit from the various learning opportunities and resources SPE provides. The delivered session was a great opportunity to present the advantages of an SPE membership to students, and to kick-off the establishment of an SPE-KSA student chapter at Al-Asala University.

At the end of the session, students were given the chance to sign up for a one-year free SPE membership sponsored by Chevron. The participation from students exceeded our expectations, with over 40 students signing up for a membership. With this number of participants, we can take the next step in our goal to establish our SPE chapter in Al-Asala University.



scan to share

**Written By:** Ahmed Mokhtar

### SPE KFU AWARENESS SESSION

**DR. MAJDI ALFAIAD**

SPE Faculty Advisor at KFU

A virtual session was conducted on December 8th, 2020, through Zoom to King Faisal University's students and faculty. Over fifty (50) attendees joined the interactive session, which consisted of students and faculty from the College of Engineering at KFU. The main goal of this interactive virtual session was to introduce SPE to the attendees and encourage them to join our society. A variety of activities were presented to grasp the attention of the attendees in order to make sure that more students are enrolled to the SPE programs. Through the session, SPE sections and programs were introduced with emphasis on the benefits of being part of an SPE section. As a result, attendees were interactive and eager to learn more about SPE's upcoming events and the membership process.

Most of the attendees were able to join the society, with their main goal being to gain insight into the oil and gas industry. As such, technical sessions and workshops are conducted regularly to meet SPE's vision. In addition, technical and interpersonal skills are enormously enhanced when engaging with such diverse sessions.

The session reflected great engagement from students and faculty who were eager to learn more about SPE. The presentation encompassed all needed information about SPE and, most importantly, the benefits of becoming a member of this society. Consequently, most of the students took the chance to join after learning about the great impact that could be gained by becoming a member.



scan to share

**Written By:** Abdulaziz AlKhateeb



## SPE KSU AWARENESS SESSION

**DR. MOHAMMED AL-MOBARKY &  
DR. ABIODUN MATTHEW**

Chairman of Petroleum & Natural Gas Engineering  
Department, and SPE Faculty Advisor at KSU

The SPE university student outreach team conducted a virtual awareness session on December 8th, 2020, for King Saud University (KSU) students to introduce them to SPE and encourage them to join. Over thirty (30) guests attended the session. Attendance was comprised mainly of students from the college of engineering, as well as the chairman and advisors from KSU's SPE chapter.

King Saud University is one of the five active SPE chapters in Saudi universities, and the only one in the Central Region. To support KSU's SPE chapter, the student outreach team hosted an online awareness session intended to introduce SPE to the students and incentivize them to join. The session included a presentation highlighting the multiple teams, activities of SPE, and the benefits that members are expected to gain. The presenter chose to emphasize on benefits that are of most interest to students, namely the access to self-development programs. The total number of attendees reached over 30, and mainly consisted of students from the college of engineering, in addition to the Chairman of Petroleum & Natural Gas Engineering Department (Dr. Mohammed Al-Mobarky) and advisors of the KSU-SPE chapter. The Q&A session was highly active with various questions and suggestions from the attendees.

The awareness session was presented by Abdolrahman Alsaif, with the support of his team leader Meshal Alshalan. The team will continue to extend their support to KSU's SPE chapter, as well as expand the reach of SPE to more students in different universities.

**Written By:** Abdolrahman Alsaif



scan to share

## SPE PMU AWARENESS SESSION

**DR. JAMAL NAYFEH**

Dean of College of Engineering, and SPE Faculty  
Advisor at PMU



scan to share

A virtual session was conducted on December 10th, 2020, through Zoom for Prince Mohammed University (PMU) and faculty, with the cooperation of the Student Outreach team. Over fifty (50) attendees joined the interactive session, including the Dean of College of Engineering, faculty, and students from the college of engineering at PMU. The main objective of the session was to raise awareness about SPE and encourage students to be part of the society. During the session, SPE Student Outreach's mission and 2021 plans were discussed, which made students enthusiastic to participate as volunteers in upcoming opportunities. Dr. Jamal and the students discussed participation in conferences and events and the benefits that this type of participation adds to their networking skills.

Students were excited to be part of the SPE society and start enhancing their skills and accelerate their professional development. Additionally, this will help bridge the gap between academia and industry to facilitate students' transition into the workforce in the future.

The virtual session was moderated by Mohammed Alatigue with the support of Loyal Alhussain & Raneem Luhaidan. The awareness session allowed students to be in discussion with the session moderators. As a result, the students were interested in joining the SPE society and registered for memberships.

**Written By:** Mohammed Alatigue



## YOU 2.0

Student Edition



scan to share

The SPE-KSA Student Outreach, in collaboration with a world-leading educational technology company, Fullbridge, concluded a well-rounded virtual experience (You 2.0 Program) exclusively delivered to university students in the Kingdom. Over 80 applicants applied to the program, and 40 students were shortlisted to participate. The program's objective was to effectively present three of the most in-demand skills in the modern market: Critical Thinking, Creative Thinking, and Emotional Intelligence. The students demonstrated substantial commitment and diligence by completing the program requirements with outstanding participation in its deep dive sessions. The students who completed all program requirements received gold certificates. The program received positive feedback from participants, allowing the team to look at the possibility of expanding its outreach to encompass more students in the future, with various learning opportunities.

The program kicked off on September 27th with opening remarks from SPE-KSA Public Relationships Chairperson, Abdulaziz Al-Suwailem, followed by SPE Student Outreach representative, Heba Al-Soqair, who highlighted the substantial benefits of the skills offered in the YOU 2.0 program, especially once students join the workforce. This was followed by a lively presentation by the renowned speaker, Steve Brazell, who is one of America's most sought-after brand strategists.

The students were required to attend the weekly live deep dive sessions and complete the online reading and tasks to receive their certifications. The program was well-received with an overwhelmingly positive feedback from the students who will hopefully capitalize on the skills they have gained from this course in their prospective careers. The successful story will be continued as SPE-KSA Student Outreach is planning to continue to foster their partnership with Fullbridge to provide a new offering of YOU 2.0 program to the students across the Kingdom in 2021.

**Written By:** Heba Al-Soqair & Meshal Al-Shalan





## RENOVATION OF UNDERPRIVILEGED HOMES

On October 19th, the T&SA team had a second collaboration with Tarmeem Charity Organization to participate in the renovation of an underprivileged family's home.

A total of 10 participants handled the painting of 3 rooms in the house under renovation. The activity took 3 hours and started with a brief training session about the basics of painting as well as safety precautions.

The team enjoyed the activity and found the experience to be highly rewarding. Their efforts were very much appreciated by Tarmeem organization and the owners of the renovated home.



scan to share

Written By: Arwa AlHilal



## HONORING OF T&SA VOLUNTEERS

On November 22nd, Badriah AlHarbi and Mohammed AlRubaie, who are T&SA team members, were honored in the ceremony held by the Ministry of Housing, specifically for the Developmental Housing initiative. Badriah and Mohammed were honored for their roles in leading the two initiatives that were held in collaboration with Tarmeem Organization. The ceremony was attended by H.E. Prince Ahmed Al Saud, H.E. Prince Saud Al Saud and the Minister of Housing, H.E. Mr. Majed AlHogail.



scan to share

Written By: Arwa AlHilal

## KSA SECOND CROSS COUNTRY RACE

On November 20th, 2020, SPE-KSA's T&SA team was delighted to participate in the organization of KSA's Second Cross Country Race. This event was held in collaboration with the Ministry of Sports and The Saudi Athletics Federation, and T&SA secured a number of volunteers to assist in its organization. The race took place in Half Moon Bay in one lap that was 2km long and lasted for 4 hours. A total of 81 amateur racers participated in the race, 49 males and 22 females, as well as professional racers from different age groups.



scan to share

Written By: Arwa AlHilal

Event Lead: Nasser AlMulhim





## WALL PAINTING OF IFAA ORGANIZATION

During the period from November 20th-21st, the SPE-KSA T&SA ran a volunteering activity to paint the wall of Ifaa Non-profit Rehabilitation Organization (under Prince Sultan Rehabilitation Center). Ifaa provides rehabilitation services for people with special needs and offers several services including day care, physical and mental rehabilitation and prosthesis. The activity targeted painting the entire first floor, which was under renovation to be converted to Physiotherapy Outpatient Clinics and administrative offices. A total of 45 volunteers from different age groups participated in this activity and the work was completed in 3 shifts per day, over the period of two days.



scan to share

**Written By:** Arwa AlHilal

**Event Lead:** Nada AlJuraib



## BLOOD DONATION CAMPAIGN

The SPE-KSA T&SA team conducted the annual blood donation campaign during the month of November, 2020 in collaboration with King Fahad Specialist Hospital. Due to COVID-19 restrictions, the campaign was conducted in one company only over the period of 4 days, following the proper precautionary measures. Schlumberger generously hosted the campaign this year at two different locations (2 days per location). It ran from November 23rd until November 26th, with a total of 198 donors.



scan to share

**Written By:** Arwa AlHilal

**Event Lead:** Nahed AlDossary  
Arwa AlHilal



## CYCLING BASIC GROUP TRAINING

On December 26th, the SPE-KSA T&SA team organized a Cycling Basic Group Training activity. This activity was held in collaboration with TRI HQ team, Wheels Bikes, Bike Khobar, Arzaq Plus and Loqmatain. There was a total of 80 participants from diverse age groups ranging from 16 to 60 years old. The activity took place in Al-Fanar where the organizing team gathered at 8:00AM and kicked off the preparation at 9:00AM. The 2KM journey started at 10:00AM and lasted for 2 hours. This activity gave participants the opportunity to experience cycling group training and learn the basics of cycling along with the necessary safety tips. This fun activity was both a socializing and learning opportunity and was very well-received by all participants.



scan to share

**Written By:** Arwa AlHilal

**Event Lead:** Munirah AlDurwish





## TERTIARY RECOVERY: THE DISHWASHER ANALOGY



**Dr. Yara Alzahid**  
Petroleum Scientist  
EXPEC Advanced Research Center  
Saudi Aramco



**Ali Altowilib**  
Petroleum Engineer  
EXPEC Advanced Research Center  
Saudi Aramco

Discovering a hydrocarbon reservoir is great, but producing it fully is the ultimate joy. Achieving such a challenging target requires various methods that can be categorized into primary, secondary and tertiary recovery mechanisms. Primary recovery techniques represent the first stage involved in extracting oil and gas. Simply put, this technique relies on the natural difference between surface and reservoir pressures. This differential pressure assists in the displacement of hydrocarbons from the reservoir up to the surface. Think of it as if you are squeezing a juice box with your hand, where your hand represents the subsurface pressure. Following that, secondary recovery techniques or waterflood are typically implemented, where water is injected into the reservoir through injection wells to maintain its pressure. Injectors are usually placed on the edge of the reservoir, and water displaces the hydrocarbons towards the producer wells. Even after applying primary and secondary recovery techniques, large quantities of oil are left and bypassed due to capillary, gravitational, and viscous forces. This is exactly like the old days, when you would try and squeeze every last drop of your toothpaste, but just cannot. Or even worse, seeing leftovers of your favorite milkshake or Nutella chocolate on the sides of the wall. The leftover oil can be recovered through tertiary recovery or enhanced oil recovery (EOR) methods. Depending on many factors, typical EOR methods can recover +10% of additional oil. The most popular EOR methods are thermal, chemical, and gas injection methods.

To explain EOR methods, a household dishwasher will be used as an analogy. To break the similarities down, we list below five steps that are important to both dishwashers and EOR processes.

**Step 1:** To start with, a plate can be made of (Alumina) due to its hardness and ability to withstand high temperatures. Alumina is also found in sandstone reservoirs.

**Step 2:** A plate is initially oil-free, prior to getting in contact with greasy food. This is similar to oil reservoir rocks prior to oil migration. The plate becomes dirty after a delicious dinner and reservoir rocks become saturated with oil following a hydrocarbon migration from the source rock to the reservoir, respectively.

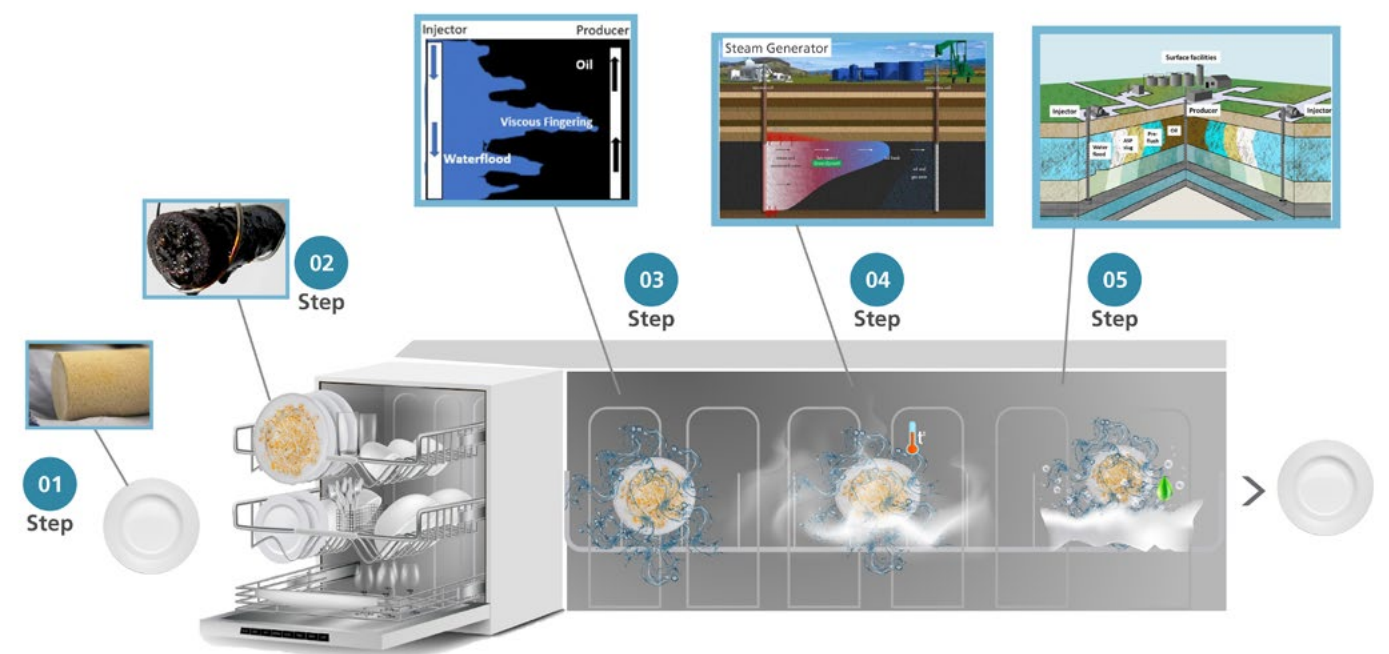
**Step 3:** The first stage in the dishwasher cleaning process is the pre-wash/rinse stage. Warm water goes through the spray arm inside the dishwasher to rinse dishes and remove or mobilize large stains. This is analogous to a secondary recovery mechanism of hydrocarbon reservoirs, which includes injecting seawater or produced water to maintain reservoir energy and sweep oil to adjacent producers. After a certain period of rinsing, warm water is no longer sufficient in mobilizing stains. Likewise, inefficiency arises in water flooding processes due to reservoir heterogeneity and early water breakthrough.

**Step 4:** Going back to the rinsed dishes inside the dishwasher, hot water (up to 60°C) is then pumped to sanitize the dishes. This process is very similar to thermal recovery, an EOR method applied in heavy oil reservoirs. Thermal recovery is one of the most popular EOR methods, accounting for ~50% of EOR operations conducted. Put simply, it is very much analogous to soaking your dishes in hot water, which loosens up grease to make them easier to wash. Dry heat or steam is injected into the reservoir in order to loosen up the oil and reduce its thickness, making it easier to extract and move around.

**Step 5:** After the sanitization or hot water cycle, the dishes are cleaned with soap tablets. Soap reduces the interfacial tension between water and the contaminants or grease on the plates. This is similar to the concept of another EOR method, known as Chemical EOR, which

uses three main compounds: polymers, surfactants (soap - similar to the tablets used in dishwashers) and alkali. Polymers reduce the mobility of injected water, which enhances the macroscopic sweep efficiency. Surfactants lower the interfacial tension between brine and oil, and Alkali generates soap in situ when reacting with crude oil. Again, using the dishwashing analogy: chemical EOR, particularly surfactant and alkali flooding, is like using soap on greasy dishes. Similarly, these chemicals loosen up the oil along reservoir channels, making the surface tension have less of an effect, which would result in increasing the recovery factor.

In short, EOR techniques that are complex in nature and practice, can be simplified when compared to day-to-day household tasks, like washing dishes. The similarities are in terms of chemistry and displacement processes involved along with their main objective: a lower oil saturation, or clean dishes.



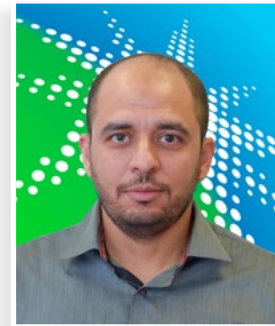


## SEEING IS BELIEVING Downhole Cameras Go Where Our Eyes Cannot

We all use cameras every day for taking selfies and pictures of objects we like. Cameras were invented over a century ago, and since then they have changed the way we go about our lives. Cameras have become increasingly integrated into our lives due to our smartphones, and they continue to play an important role in a variety of industries such as entertainment, social media, and marketing. Realizing the value that cameras could add to operational decision-making, petroleum engineers always dreamt about having cameras that could enable them to see what happens thousands of feet below ground.

Presently, downhole cameras are widely used in wellbore interventions for a variety of diagnostic operations, including but not limited to: obstruction identification and characterization, locating sources of sand and water influx, as well as the design of workover operations. These downhole cameras offer both colored and black-and-white images, as well as videos to help engineers better understand and visualize downhole challenges. The cameras provide both live feeds as well as memory-based data storage, depending upon the nature of conveyance. All available modes of conveyance such as wireline, slickline, and coiled-tubing are able to run downhole cameras, and the choice is based on the wellbore trajectory and the nature of fluids present in the wellbore.

The two types of cameras used for wellbore intervention



**Saad Hamid**  
**Production Engineer**  
Southern Area Production  
Engineering Department  
Saudi Aramco



**Abdulrahman Almulhim**  
**Petroleum Engineer**  
Gas Reservoir Management Department  
Saudi Aramco

are the downward facing and side facing cameras. In addition to that, the cameras are also capable of rotating with the help of a built-in motor to provide 360-degree coverage of the wellbore, and they are also equipped with LED lights for enabling the capture of images in the normally very dark downhole conditions. The figures below show the two types of camera (monochrome and color) that have been deployed.



Figure 1A

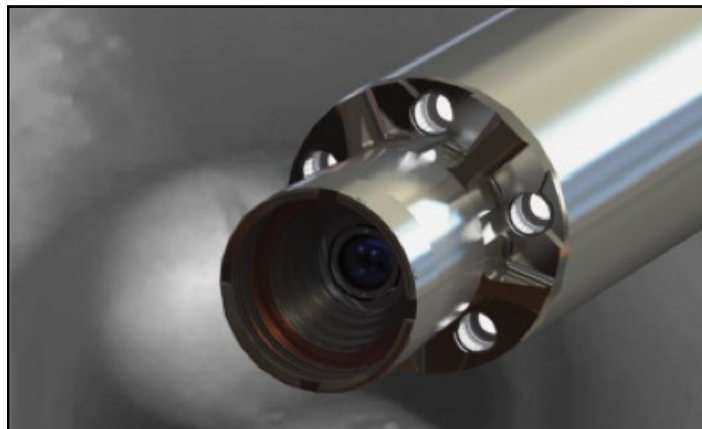


Figure 1B

The specifications for the downhole camera are as per the table below:

Specifications	Camera A	Camera B
Diameter	2 1/8-in	1.7-in
Length	229.41-in	147.5-in
Pressure Rating	15,000 psi	15,000 psi
Temperature Rating	392°F	257°F
Camera Type	Downview (Monochrome)	Downview and Motorised Sideview (Colour)

Table 1 – Downhole Video Camera Specifications

One of the main limitations of downhole cameras has been the inability to get clear images of downhole anomalies. This is attributed to the fact that the camera lens easily gets dirty, resulting in poor image quality. In order to address this challenge, the downhole camera is coupled with another attachment with coiled-tubing that allows cleaning the camera lens during the operation, and hence enables high quality images at the depth of interest. We will now discuss the use of the downhole camera with coiled tubing and its applications in oil and gas wells.

The camera requires power to capture images or video. This power is supplied through a copper wire (called the conductor) which is run through the coiled tubing pipe. This encased copper wire is about 3mm in diameter (as shown in figure 2) and is inserted into the coiled tubing pipe. This conductor is used to communicate/transmit data as well as power. The cable is designed to withstand high pressures during well operations.

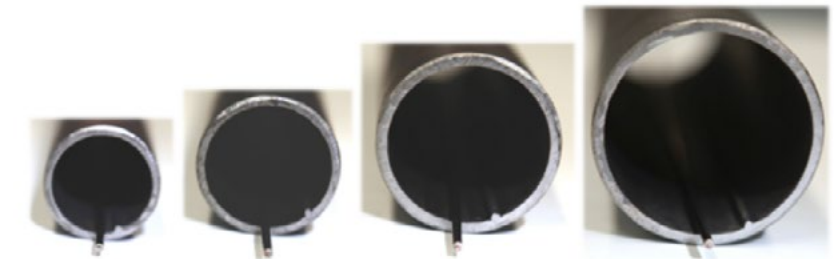


Figure 2 – 1/8-inch mono-conductor cable inside 1 1/2-in, 1 3/4-in, 2.0-in and 2 3/8-in Coiled Tubing

When the camera is run in oil and gas wells, the lens can get dirty due to different types of fluids present in these wells including oil, water, and sand. To address this challenge, a special tool is designed and used to help wash up the lens inside the wellbore as and when it gets dirty or plugged with debris. Figure 3 shows the details of this tool.



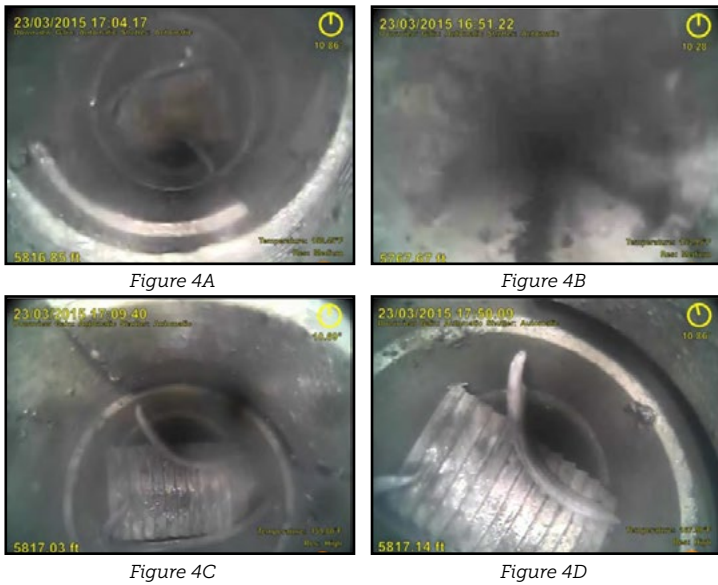
Figure 3 – Flow guide to divert the flow from inside the coiled tubing to outside on the camera lens



**DOWNHOLE CAMERA APPLICATIONS:**

We will now look at a couple of applications where the results obtained using the downhole camera with coiled tubing provided outstanding answers to downhole mysteries.

**Application #1:** Well A was drilled as a vertical oil producer. The well was put to production through 4 ½-inch tubing. While performing a slickline operation, an obstruction was encountered at 5,811 ft inside the tubing and the well was left shut-in. A coiled tubing assisted downhole camera run indicated presence of metal debris, which appeared to be packer slips and strips of metal. Figure 4A captures the liner hanger, Figure 4B captures the scale buildup on tubing walls, and Figures 4C and 4D capture the obstruction in the wellbore. Based on the images obtained, the well was later prepared for fishing operations in order to retrieve the strips of metal.



**Application #2:** The subject well was drilled as a horizontal gas producer and was completed. An obstruction was encountered at a depth of 10,462 ft. Subsequently, a 3-inch lead impression block (LIB) was run to get an impression of the obstruction profile. Figure 5A shows the LIB image. A decision was made to perform a camera run on coiled tubing. From the images obtained after the camera run, there were two important observations. Figure 5B indicated a partially broken ceramic disc and Figures 5C and 5D indicated a change in tubular texture, which could be correlated with a parted pipe and exposed liner behind the tubing. This information led to the inference that the tubing had, in fact, parted and dropped thereby exposing the casing. Based on these observations, a workover was performed that confirmed the conclusions drawn using the downhole camera.

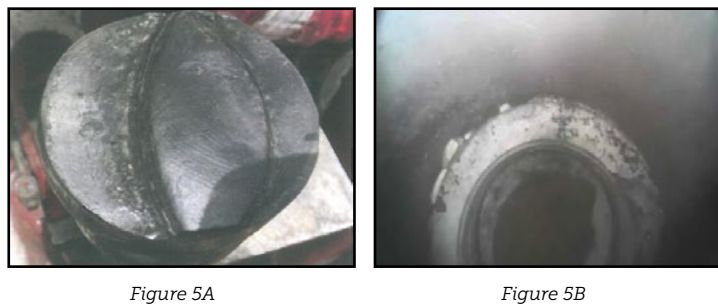


Figure 5C  
Figure 5D  
Figure 5B – Partially broken ceramic disc  
Figures 5C and 5D – Casing Collar texture observed, indicating liner exposed behind a potential parted pipe

**The case histories presented in this paper help us draw the following conclusions:**

- The downhole video camera is a useful tool for well interventions as it helps take assumptions out of the equation by providing actual downhole images of completion components and scale buildup.
- The side view camera has added a new dimension to wellbore diagnostics by enabling operators to investigate downhole conditions from multiple angles.
- The conveyance of downhole cameras is proving more effective with coiled tubing even in vertical wells because of the ability to circulate fluids.
- The integration of downhole cameras with a cleaning tool has considerably improved the quality of downhole images and, in turn, also improved well intervention efficiency by improving the success rate of camera runs.
- With the assistance of flow guide, the cleaning fluid can be transported close to the camera lens and can be washed to improve the image quality, resulting in crisp imagery, and hence a better understanding of downhole challenges.

With the development of the enhanced coiled tubing BHA, along with robust telemetry system and downhole camera technology, operators are better-enabled to make effective decisions while saving time during well operations and interventions. While downhole cameras provide their value in well operations through effective diagnostics, it is a small step towards a major paradigm shift in the energy industry. The extension of the camera into the downhole world of oil and gas wells, yet again, proves the power of human imagination and the unlimited potential of its creativity.

**References:**

Taggart, M., Murray, N., Strugeon, T.: "Operational Benefits of Coiled Tubing With New Real-Time Data Communication System", SPE 142714, SPE/ICoTA, 5-6 April 2011, Texas

De Jonge, R. M., Tousis, U., Nijenhuis, J.: "How Intelligent Coiled Tubing Technology Combined with Real-Time Downhole Camera Visuals Created a Formula for Success During a Challenging Thru-Tubing Recompletion Operation in the North Sea", SPE 170816, SPE ATCE, 27-29 October 2014, Amsterdam



scan to share



# THE SURFACE LOGGING ADVANTAGE



**Steve D'Souza**

Formation Gas Analyst  
Excellence Logging



**Amjad M. Kharaba**

Petroleum Engineer, Reservoir Description  
& Simulation Department (RDSD)  
Saudi Aramco

As a part of IR4.0, an online session was conducted between Saudi Aramco's RDD, Saudi Aramco's young professionals, and Excellence Logging (EXLOG), a surface logging company. The purpose of the session was to create awareness around existing technologies implemented in both exploration and development wells.

The importance of understanding the source of the data was discussed as a prelude to the presentation. Since the surface logging process is non-invasive and does not require the use of downhole tools for data collection, the service and technology are deployable on any type of well. High pressure and high temperature (HPHT) wells, unstable holes, and other adverse hole conditions do not affect the operation of the service on the rig.

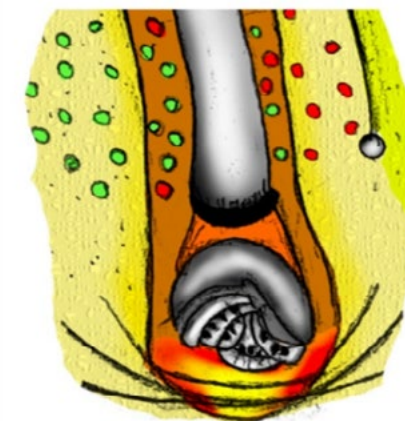
While drilling a well, information is conveyed to the surface by the drilling fluid and is collected in the form of formation lithology, hydrocarbons, and drilling parameters. All this information can be recorded on a digital time and depth database, with the ability to see historical data, and visualize the information from a well. With this advantage, surface logging can highlight reservoir potential from hydrocarbons, and guide informed decision-making based on drilling parameters and lithological cuttings. In addition to that, this information serves as an early indicator of potential HSE hazards while drilling.

The pursuit for high quality information and the need to make quick operational decisions have both led to

technological advancements for onsite applications such as quantitative data analysis on the rig. Mudlogging services were deployed on a directional (i.e. non-vertical) well that was being drilled and the results obtained addressed a long-standing challenge of quickly delineating zones of interest. In such wells, decisions often have to be made on-the-fly in order to maximize reservoir contact, especially in thin bed reservoirs.

Advanced analysis on drilled cuttings essentially employs an on-site laboratory, analyzes formation cuttings, and provides elemental and mineralogical information for applications critical for decision making. For instance, Elemental Gamma Ray (EGR) logs can be obtained while drilling and can suggest possible zones of producibility and potential fracking zones based on the brittleness index. Other applications include the detection of organic content and hydrocarbon potential in unconventional reservoirs.

Advanced hydrocarbon applications were utilized for reservoir fluid identification and to highlight the zones of hydrocarbon concentrations within the formations, and also to detect false hydrocarbon signatures that could be misleading due to Drill-Bit Metamorphism (DBM). DBM is a phenomenon that is the result of multiple variables, like oil-based drilling mud contents, hard/corrosive formation, and frictional heat generated at the drill bit-formation interface. A combination of these variables causes the generation of hydrocarbons due to thermal cracking.



*Friction of the bit with the formation results in Drill-bit Metamorphism (DBM)*

When integrated with petrophysical models, advanced hydrocarbon and cuttings analysis provide a comprehensive suite of information with effective solutions for optimizing wells while drilling.

A Q&A session was held to discuss these observations and to understand the challenges faced while drilling these wells with the aim to share knowledge and experience with young professionals.

**Special thanks to Saudi Aramco's RDD, Faisal Al-Enizi, Ali Belowi, Amjad Kharaba, Mohammed Azizi and Raneem Luhaidan.**

## References

*Drill-Bit Metamorphism: Recognition and Impact on Show Evaluation (SPE125218)*



scan to share



# BEAUTY IS IN THE EYE OF THE MACHINE

## How Technology has Changed the Art Industry



**Rawan Nasser**  
Content Developer and Strategist  
Saudi Aramco

### Generative Art

On Oct. 25, 2018, Christie's New York auction house sold what was promoted as the first piece of fine art to be created by artificial intelligence (AI). Art critics estimated that the portrait of a fictitious 18th century character dressed in a white blouse and black robes would sell for \$10,000 at most for its novelty. What no one foresaw is that the "Edmond de Belamy" print would sell for \$432,000.

The 70x70 cm print was one of 11 portraits that three French students, who go by the name of Obvious, created using a type of algorithm called generative adversarial network (GAN). The painting's title is a play on bel ami, French for "good friend," and a reference to Ian Goodfellow, a machine learning researcher who first came up with GAN as a tool for creating art in 2014.

Creating images using GAN includes feeding a network a dataset, such as historical paintings, to develop replicas while a second network judges whether the generated visuals match the original data and rejects those it deems as fake. But most people missed that part, and were misled to believe that an AI created the work using its own innate creativity.

### The True Value of Art

When news of the \$432,000 sale became public, members of the creative coding and AI community were quick to point out that the code used to generate the Belamy painting belonged to a teenager from West Virginia called Robbie Barrat. Since Barrat used a license that allows others to use the code, there was nothing he could do about it. However, this controversy and sale price of the painting raised many questions.

If we can create a product using code, this means that we can replicate it endlessly. While each of these copies may behave in different ways, the essence of the work remains the same. Would we under these circumstances consider this kind of art original work or do the means of production dilute the value and authenticity of the work?



Portrait of Edmond de Belamy at Christie's in New York



Harold Cohen and Aaron - NYT

### Creative Coding – Not that New

Using creative code and sophisticated networks to produce pieces of art has been a growing field for the past 20 years. One of the pioneers in the field of computer-generated art is Harold Cohen, who developed a software called "Aaron" in the 60s, a robot holding a marker that he programmed to recognize the way objects relate to each other and to create basic shapes. Cohen viewed his early iterations of the painting system as a way to further his understanding of how human cognition is activated when engaged in the act of painting.

Cohen's process is very different from what the French collective used to create the Belamy portrait. Cohen used a machine to physically draw pieces of art, while the students used a line of code. Both of these methods used machine learning and are definitely novel ways of creating art. But if a line of code can generate 1,000 paintings of the exact same style, is one of them worth \$400K?

### New World of Art

Much like the area of scientific research, the culture of creative coding is a world of its own that is often difficult to translate into simple terms. "It's almost like predictive text technology on our phones, we use it every day but can't explain exactly how it works" said Tom White, a lecturer in computational design based in New Zealand.

The question about the worth of a piece of art changes dramatically when we introduce the concept of digital scarcity. We now have artwork that is bought and sold on blockchain and these images or products are considered valuable because they are truly rare, having a code that ensures their authenticity and that tracks their chain of ownership.

The advancement and development of technology is truly pushing the boundaries of our understanding of how to view and value art. "There is nothing in traditional art that would prepare us to understand this new breed of art appreciators and creatives," said art blogger Jason Bailey.



CryptoArt by Norma Xelda Jara



CryptoArt by Norma Xelda Jara



scan to share



# Sleep Deprivation: Why You Should Be Sleeping Like a Log



**Reem Alsadoun**  
Reservoir Engineer  
Saudi Aramco

- **Do you need the assistance of an alarm to wake up on time?**
- **Do you find yourself re-reading the same email?**
- **Are you unable to function properly before noon without consuming caffeine?**

If you've answered yes to at least one of these questions, you most likely suffer from sleep deprivation. Most people reading this article are likely to meet the criteria for sleep deprivation, and part of the problem is that we culturally glorify this as a part of the daily hustle and grind. In this article, I wish to challenge this culture, and present the virtues of sleeping like a log.

In his book, "Why We Sleep: Unlocking the Power of Sleep and Dreams", neuroscientist, sleep expert and director of UC Berkeley's Center for Human Sleep Science, Dr. Matthew Walker, presents a compelling examination of the importance of sleep, and a terrifying account of the consequences of sleep deprivation based on the latest scientific research on sleep. This article synthesizes some of the big ideas and important lessons presented by Dr. Walker.

Sleep is singlehandedly the best thing we can do to ease our minds and rest our bodies every single night. Without it, not only are our cognitive functions (learning, reasoning, attention) severely undercut, but our health is also at an increased risk of being inflicted with chronic illnesses i.e. strokes, heart attacks, and cancer. The equation is rather simple: the less we sleep, the shorter our life span. To understand how such dire consequences occur, we must start with defining sleep.

## Defining Sleep

Sleep is defined as a period of reduced activity when a person's sensory awareness of external stimuli is significantly reduced, and is characterized by the partial or full absence of consciousness. Sleep is divided into two main stages: the NREM stage which is further divided into four stages, and REM sleep, which is also known as "dream sleep". The body is constantly cycling between the NREM and REM sleep. NREM sleep is characterized by deep and slow brainwaves (slower than those in a state of wakefulness), and it is in this stage that we experience what is commonly described as a "black out". This stage helps solidify information, and transfer memory from short term memory to long term memory, helping us process new information.



REM sleep, on the other hand, is characterized by accelerated breathing, brain activity, eye movement, and extreme muscle relaxation. REM sleep also occurs 90 minutes into sleep and lasts for 10 minutes. Typically, dreams occur during this stage as a result of increased brain activity. Studies have shown that REM sleep helps connect past experiences and new information, which allows us to develop new insights and improve problem solving capabilities. Interestingly, during REM sleep, the body experiences full paralysis, preventing you from acting out dreams. Sleep has also been proven to be critical in enhancing our health by strengthening our immune system, reducing our susceptibility to chronic illnesses, and improving our mental well-being.

Sleep is regulated by two main factors: Our biological clock (also known as circadian rhythm) and adenosine. Circadian Rhythm describes a process which regulates sleep and wakefulness throughout the day and is what is commonly referred to as your body's internal clock. The circadian rhythm is regulated by the Suprachiasmatic nuclei (SCN) located in the middle of the brain, and is also connected to our optic nerve. When our eyes detect light, the SCN sends signals to the rest of the body, raising body temperature, heart rate, blood pressure, and delaying the production production of melatonin promoting wakefulness.

Melatonin is a hormone that is naturally produced when daylight fades, making us feel sleepy and mediating our circadian rhythm. Sleep drive describes our biological need for sleep. When we wake up in the morning, our sleep drive is very low, and as the day progresses, the need for sleep increases significantly until we succumb to it. This sleep pressure is controlled by adenosine, and when adenosine increases, the pressure to sleep increases. Caffeine works to counteract the sleep pressure by binding to the adenosine receptors, blocking its production and reducing sleep pressure, and, thus, promotes wakefulness. Although caffeine overrides adenosine, adenosine continues to accumulate throughout the day. The moment caffeine is flushed out of our systems, the drive for sleep returns with a vengeance.

## Napping

In most industrialized countries, people sleep once a day on average for less than seven hours. While this pattern is common, it is not necessarily the healthiest. For most of humanity, sleep was normally biphasic (sleep for two segments per day). It is only with the advent of the industrial revolution that monophasic sleep became the norm. It comes as no surprise that in many parts of the Mediterranean, with the "siesta" culture of taking midafternoon naps, men are four times more likely to reach the age of ninety compared to the average American. Studies have also shown that countries that have given up on midafternoon naps have a 37% increased risk of death from heart disease compared to countries who maintained the "siesta" culture. Therefore, the most natural pattern for sleep would be a full 8 hours of sleep at night, followed by a 30-minute to 1-hour nap in the midafternoon.

## The Dangers of Sleep Deprivation

There are many ways through which sleep deprivation could shorten your lifespan, and some are faster than others. The main issue with sleep deprivation is that you aren't aware of the extent of your deprivation when you are lacking sleep. A study carried by AAA foundation in 2016 on over 7,000 drivers in the US indicated that getting 5-6 hours of sleep almost doubled a driver's chance of getting into a car crash. Obtaining under 4 hours of sleep increases the chance of getting into a car accident by 12 folds. Sleep loss has also been shown to significantly increase the risk of heart attacks and strokes. Numerous studies have shown that sleeping under 6 hours could increase this risk by approximately 45%, and beyond the age of 45, this risk increases by approximately 200%. Weight gain can also be caused by lack of sleep. When sleep deprived, the body produces more ghrelin, the hormone responsible for hunger, and less leptin, the hormone that signals your body to stop eating and reinforces impulse control. Studies have also shown that sleep helps fight against infections, and boosts natural killer cells that fight tumour cells.



### Tips for Better Sleep

In his book, Dr.Walker emphasizes the importance of practicing healthy sleep habits by applying the following:

- Stick to a Fixed Sleep Schedule: Commit to sleeping and waking up at the same time, even during weekends. Making up for sleep during the weekend does not fully compensate for sleep during the week. In fact, it makes it more difficult.
- Exercise: Make sure to exercise for at least 30 minutes on most days. However, avoid exercising close to your bedtime (2-3 hours before bedtime).
- Avoid or Minimize Caffeine: It takes caffeine as much as 8 hours to leave your system, a cup in the afternoon will, therefore, disrupt sleep.
- Avoid or Minimize Nicotine: Like caffeine, nicotine is also a stimulant that causes smokers to sleep lightly. Smokers tend to wake up early since they experience nicotine withdrawal.
- Avoid Large Meals and Drinks: Large meals cause indigestion, and large beverages result in frequent trips to the bathroom, both of which disrupt sleep.
- Avoid Naps After 3 P.M.: Given their close proximity to bedtime, late afternoon naps make it harder to fall asleep.
- Relax Before Bedtime: Incorporate healthy and relaxing activities, such as reading a book or meditating, as a part of your sleep ritual.
- Take a Hot Bath Before Bedtime: Hot baths result in a drop in your body's core temperature, helping you feel sleepy.
- Bedroom Environment: Make sure your bedroom is dark, cool (up to 18 degrees Celsius) and gadget free.
- Sunlight Exposure: Given its impact on the circadian rhythm, make sure to go outside for at least 30 minutes to promote wakefulness or wake up with the sunrise.
- Avoid lying in Bed Awake: Many times, people will find it difficult to fall asleep while in bed. If this persists for more than 20 minutes, it is recommended to get up and practice a relaxing activity until you feel sleepy.



scan to share

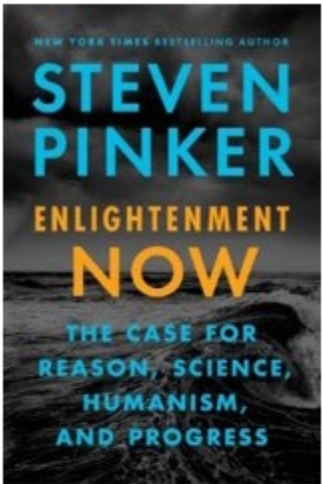


**Nouf Alotaibi**  
Petroleum Engineer  
Saudi Aramco



scan to share

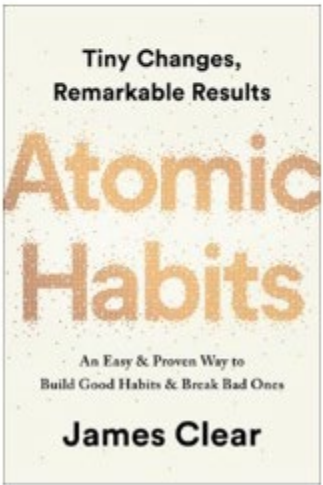
## In Times of New Beginnings



**"There can be no question of which was the greatest era for culture; the answer has to be today, until it is superseded by tomorrow."**  
- Steven Pinker

If you think the world is coming to an end, **think again**

Steven Arthur Pinker is a prominent Canadian-American experimental psychologist, cognitive scientist, and author of popular science. In this book, he explores every measure of human progress throughout history in terms of health, poverty, inequality, democracy, and more, by using data collected from multiple literatures. He explains how progress was achieved through reason and science, yet, debates the challenges of our modern world that hold humanity back .

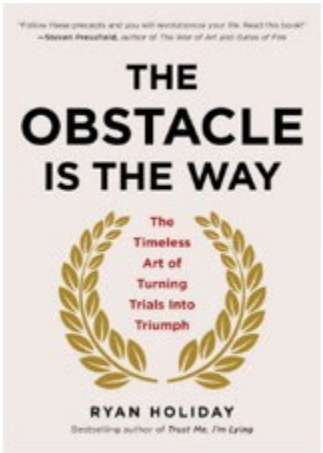


**"You do not rise to the level of your goals. You fall to the level of your systems."**  
- James Clear

What we can achieve depends on the **small habits** we do every day

James Clear offers a proven framework for daily improvements, and reveals practical strategies that teach you exactly how to form a good habit, break bad ones, and master the tiny behaviors that lead to remarkable results.

This book reshapes the way you think about progress and success, and gives you the tools and strategies needed to transform your habits. Also, it will help you whether you are a team looking to win a championship, an organization hoping to redefine an industry, or simply an individual who wishes to quit smoking, lose weight, reduce stress, or achieve any other goal.



**"There is no good or bad without us, there is only perception. There is the event itself and the story we tell ourselves about what it means."**  
- Ryan Holiday

Think progress, not **perfection**

In this book, Ryan Holiday writes about how we should perceive the adversities we encounter in our lives as the way forward. The book analyzes the stories of men and women who were not exceptionally brilliant, lucky, or gifted. However, their success came from timeless philosophical principles to focus on the moment and not the monsters that may or may not be ahead.



## Join GEO Young Professionals and Students Wiki Write-Off Competition

Create and write technical entries on oil and gas subjects to be added to AAPG wiki

The AAPG Wiki is an open access resource on petroleum geosciences <https://wiki.aapg.org> and is accessible to everyone. The competition will engage students and YPs to research oil and gas related technical content to be added to the Wiki page with the goal of disseminating petroleum geosciences technical knowledge and making it available to the public.

The top 3 winning entries will be formally recognized and awarded.

**When:** 31st January - 30th May 2021

### Who can participate?

- An individual or a team (max. 3).
  - Current students at any university in the world or a young professional\*
- \*to qualify as a young professional, you must be under the age of 35 with less than 10 years of work experience

### How do I get the content?

The competition does not expect you to come up with the written material; instead, you are to help us digitize existing key concepts already present in literature and scientific papers.

Your textbooks and relevant introductory research papers would be perfect entry candidates.

### Plagiarism!!

Do not copy material word for word! You are expected to paraphrase, edit and include relevant images to fit wiki search result.

### Entry Requirements:

- Word documents
- Submitted before May 30th, 2021, 9 PM Arabian Standard Time
- Between 1,500 – 2,500 words (excluding references, figures or captions)
- Entries of technical quality and well-written English
- Participants should ensure that the subject of their entry is not already included on AAPG Wiki
- For quality purposes, participants are encouraged to refer to the following winning entries from a previous Wiki Write-Off competition:
  - [https://wiki.aapg.org/Well\\_log\\_analysis\\_for\\_reservoir\\_characterization](https://wiki.aapg.org/Well_log_analysis_for_reservoir_characterization)
  - [https://wiki.aapg.org/Hydrocarbon\\_reservoirs\\_associated\\_to\\_layered\\_intrusive\\_bodies](https://wiki.aapg.org/Hydrocarbon_reservoirs_associated_to_layered_intrusive_bodies).

### Winners!

All entries will be reviewed and judged by the GEO Young Professionals and Students Committee

For more information, visit [www.geo-expo.com](http://www.geo-expo.com)

## GEO YOUNG PROFESSIONALS AND STUDENTS WIKI WRITE-OFF COMPETITION JANUARY 31ST - MAY 30TH 2021

CREATE YOUR OWN TECHNICAL ENTRIES FOR THE AAPG WIKI

The [AAPG wiki](https://wiki.aapg.org) is an open access resource center that provides in-depth insight into the world of petroleum geosciences for all professional levels.

AAPG invites you to take this opportunity to create your own Wiki submission, expand your learnings and supply comprehensive knowledge to the geosciences community.

The competition will engage students and YPs to research oil and gas related technical content to be added to the Wiki page in hopes of disseminating petroleum geosciences technical knowledge.

### Who can participate?

- Teams of 1-3 individuals
  - Current Students and Young Professionals\*
- \*(to qualify as a young professional you must be under the age of 35 with less than 10 years work experience).

### Where do I find the content?

Identify oil and gas specific literature and scientific papers and help us by digitizing the key concepts these papers outline. Text books and introductory research papers would be suitable guides here.

### Submission Guidelines:

- Plagiarism: Please note you are expected to reformulate existing text and use your own words to explain what you have read. AAPG will not accept submissions that have been copied word for word.
- Entries must be submitted to Katie Steiblet ([ksteibelt@aapg.org](mailto:ksteibelt@aapg.org)) before the deadline of May 30th 2021.
- Submissions must be in Word Document Format.
- Submissions should be no less than 1500 words and no more than 2500 words (excluding references, figures or captions)
- Participants are to ensure that the subject of their submission is not already included on AAPG Wiki.
- Submissions must be of high technical quality and well written English.

Please [click here](#) to see previous competition winner entries.

All submissions will be reviewed by the GEO Young Professionals and Students Committee and the top three submissions will be formally recognized.







[spe-ksa.org](http://spe-ksa.org)