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THE SPWLA TODAY NEWSLETTER

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CALENDAR OF EVENTS

April 26 – May 31, 2018
Introduction To Basic Well Log Analysis Series
Remote via Webinar – Six Consecutive Thursdays
www.spwla.org

June 2-6, 2018
SPWLA 59TH Annual Logging Symposium
London, United Kingdom
www.spwla2018.com
June 26-28, 2018
Formation Testing, New Advances and Applications
Course Instructor: Hani Elshahawi, Shell International E&P
SPWLA Frank S. Millard Training Center
Houston, TX
www.spwla.org

July 30-31, 2018
The Role of Well Logs in Geomechanics
Course Instructor: Amy Fox, Enlighten GeoScience
SPWLA Frank S. Millard Training Center
Houston, TX
www.spwla.org

August 6-10, 2018
Basic Well Log Analysis
Course Instructors:
Dr. George Asquith, Texas Tech University
Dr. Dan Krygowski, The Discovery Group
Dr. Rick Lewis, Schlumberger
SPWLA Frank S. Millard Training Center
Houston, TX
www.spwla.org

November 7-8, 2018
SPWLA Asia Pacific Technical Symposium 2018
Bogor, West Java
Indonesia
www.spwla2018.com

From the President

Brett Wendt
SPWLA President 2017–2018

Dear Enthusiasts of the SPWLA,

As I write this I realize that this will be my last written communication as President. As with any ending, this both excites and disappoints me. I am excited to have the time to pursue other opportunities and to give back to other interests I hold. I am disappointed, as I believe that SPWLA still needs a lot of help and that I barely had a chance to effect any lasting change during my term. After serving under seven other Presidents I am sure that most (if not all) felt they could do more than they did. The reality is that there are limited opportunities that can be pursued within a year and the majority of time is spent dealing with issues that were not on your agenda.

My major goal for the year was to make SPWLA a stronger organization when I leave than when I arrived. My platform issues to achieve this were to place the organization on a sustainable financial path and grow the membership. If I were to judge my term based on these objectives, I would admit that I failed. The Board authorized increased spending and the organization did not substantially increase revenues during the year. Membership has held flat this year which is great but still fell far short of my ambition. So there lie my disappointments. But there was a fair share of success to share as well.

One big accomplishment was the approval of the change in our Bylaws and Articles of Incorporation to officially allow electronic balloting and voting. While this may not seem like a big deal, it is huge. Our organization has developed slowly, in part because we could not make any major changes without a painful and costly snail mail campaign. With this behind us, we can move more quickly and I plan to have other significant changes up for vote before my term ends.

Another major accomplishment was the redrafting of the Charter Agreement, which has successfully aligned the concerns of our Chapters and SIG's with those SPWLA. This took up half of the year by itself. The staunchest of detractors from the previous Charter have now signed the new version, which is great news for SPWLA. There was a lot of animosity and hard feelings to deal with and I hope that trust in the Board has been restored with our Chapters. But the work is not done; so, this is not in the win column yet. We still have a large number of Chapters that have not signed, but this appears to be more out of lack of effort than over concerns. I remain confident that most (hopefully all) will sign before their grace period expires at the Symposium this June. I do not desire to announce that any current Chapters are no longer part of SPWLA as my term expires.

The final accomplishment in my top three is the outcome you are reading now. I have fought for years to expand *Petrophysics* to include more social and informational content only to find myself in a stalemate with those fighting to remove what little was traditionally carried in the publication. What I never considered was having a VP of Publications who was willing to increase their workload to manage two publications and allow both sides an opportunity to declare a win. But that is exactly what happened this year. For the first time SPWLA has the opportunity to speak directly to it members on any topic and our members have a platform to share their thoughts and ideas outside of the pure technical topics allowed in *Petrophysics*. As a result, there is no longer any excuse for lack of communication between the Board, our Chapters, SIG's, or members. I have set the expectation that every Board member routinely communicates to their constituents in this publication. It will be up to you to maintain this expectation. If Board business remains a mysterious and detached process from the membership it is because you are not requiring your elected officials to uphold your interests.

This brings me to my SPWLA career closing statement, which, I admit, is purely editorial. It is amazing how consistent national politics reflect politics on any scale in the world today. I know there are some people who are so upset with "politics as usual" that they support just breaking the system. The problem is nobody can agree on what the new system should look like. What we seem to have forgotten is that democratic processes work best when no one side of an argument "wins" outright. People have been subjected to a cultural shift where compromise is cast as a "loss" in nearly every facet of their lives. We are shifting more and more towards a model where elected official believes it is their duty to see special interest issues win over common good. I believe this is more and more how people see themselves individually. We are losing the talent of being able to represent someone else's cause without making it our own. I fear what this means to volunteer organizations like SPWLA. I see more and more "volunteers" expecting things in return for their "service". Furthermore, if they do not get things their way they either quit or become a destabilizing force on every topic that does not interest them. It takes courage to stand up for what is right and to set aside personal interests for another day.

It has been my pleasure to serve SPWLA for the 10 years that I have held leadership positions in the organization. I have enjoyed much of that time. I have met so many people who have taught and influenced me that I never would have had the opportunity to meet outside of SPWLA. I have benefitted in more ways than I can count and have enjoyed support from people I hold in high respect and regard. I encourage more people to step forward and take advantage of the opportunities I had. They are waiting for you. SPWLA needs you.

As always, I am open to any comments or ideas. Please let me hear what you think!

From the Editor: Introduction to the May 2018 SPWLA Newsletter

Carlos Torres-Verdin
Vice President Publications

We received numerous supporting messages and plenty of suggestions after sending out the first issue of the SPWLA Newsletter almost two months ago. It is our intention to continue to improve and expand its contents.

The new issue of the SPWLA Newsletter includes four special invited columns penned by some of our most influential and active members. They show how our Newsletter can be used to address technical and nontechnical topics of interest to wide sectors of the SPWLA. There is no exclusivity for these columns; you may want to be an author! Just send me an email at cverdin@mail.utexas.edu, and we will take it from there. There is plenty of room for diversity and there are no publication limits.

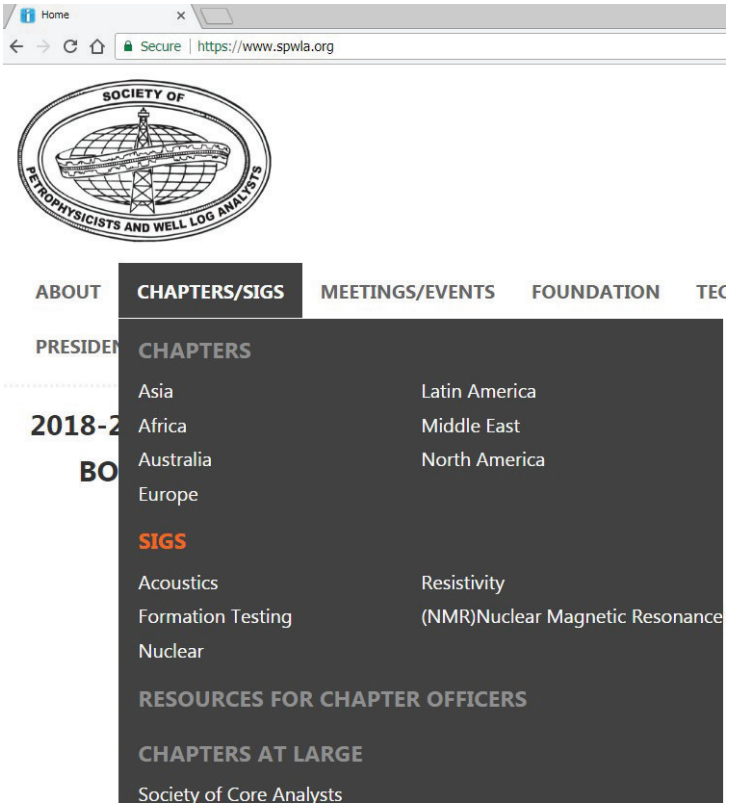
Thank you for helping us improve the SPWLA and enjoy reading through the pages of the *SPWLA Today*. See you in London!

Zhipeng "Z" Liu
2017–18 SPWLA President–Elect

Dear SPWLA members and friends of SPWLA,

Happy Spring or Fall. Hope you are enjoying the mild weather wherever you are. Part of my job as President-Elect is to oversee the various SPWLA Special Interest Groups (SIGs). Not to be confused with dark political special interest group you may have heard about in the news. SPWLA SIGs are a critical part of SPWLA and are a force for good. SPWLA SIGs provide a platform for various technological or social focus. Currently, there are six active SPWLA SIGs (1) Resistivity, (2) Formation Testing, (3) Nuclear, (4) NMR, (5) Acoustic, and, (6) YP (Young Professional). We are also in the process of reviving the High-Angle/Horizontal Well (HA/HZ) SIG. Each year, each SIG holds 1 to 2 meetings, which usually involve in-depth discussion by an subject matter expert (SME) that you won't hear anywhere else. Some SIG meetings even offer remote access. In some cases, SIGs participate in industry-wide discussions representing SPWLA and the well-logging industry. For example, the nuclear SIG has been engaging with the US Department of Energy's research on alternative radiological source technologies. Each SIG is managed by volunteer officers elected to its organizing committee.

As an SPWLA member, you can participate in as many SIGs as you desire, in addition to your home chapter. Please make sure you subscribe to them in your SPWLA member profile to get notifications for SIG events. You can find out more about five of the six SIGs by visiting www.spwla.org and then clicking on the CHAPTERS/SIGS menu (https://www.spwla.org/SPWLA/Chapters_SIGs/SIGs/Acoustics/SPWLA/Chapters_SIGs/SIGs/).



Visit the website to learn more about these recent SPWLA SIG activities:

Acoustics SIG Conference 2018: February 20, 2018, Houston, Texas.

Formation Testing SIG Meeting: March 7, 2018, Theme: "Thrive in the Lower for Longer Environment", The Woodlands, Texas.

Rt-SIG 2018 Spring Meeting: April 25, 2018, SPWLA Frank S. Millard Training Center, Houston, Texas.

SPWLA NMR SIG Conference 2018: February 23, 2018, Houston, Texas.

Jesús. M. Salazar
2017–18 SPWLA VP Technology

Oh well, everything has its beginning and its end. This is my second and last column as Vice President of Technology (VPT) and I want to use it to continue explaining the arduous process of organizing the technical program for the annual symposium. Last April 23 was the deadline to submit the manuscripts for the upcoming symposium. Of the 125 initially accepted abstracts, we will be showcasing 105, which results in a 16% attrition. A total of 20 papers were withdrawn for different reasons that range from company approval to personal issues. As it's been our policy in the recent years we don't replace those papers with lower-ranked ones; instead we select up to 20% more of what we consider an ideal number of papers, 100, give it or take. Of the 105 papers, 51 will be presented as oral talks in the main auditorium and 54 as e-posters near the exhibit hall. Whenever an author decided to withdraw a paper initially slated as an auditorium presentation we replaced it with an e-poster within the same category. By the time you read this note the final papers for all the presentation will have been received and ready for uploading to OnePetro and can no longer be withdrawn.

The passing of that deadline means that the Technology Committee (TC) members have become quite busy again. Once all the papers were received, TC members were assigned to review two to five papers. This is done to ensure that authors followed the format guidelines and avoided commercialism. Typical reasons to return the paper to the author are for not adhering to format, poor quality figures, or repetitive use of brand names and trademarks. The process is not meant to be a peer review, that may come later, if the author decides to submit his/her paper to *Petrophysics* or another journal. This task was onerous as TC members had two days to perform their reviews and the authors had four to five days to return their corrected papers, deadlines were tight.

On April 27, the TC had a conference call to finalize the program and agree on session chairs and volunteers for the e-poster sessions. The symposium will have 11 technical sessions in the main auditorium and four e-poster sessions near the exhibit hall. Each technical session will be chaired by two TC members and each e-poster block will have at least four chairpersons making sure everything runs smoothly.

Delegates should anticipate a 15-minute presentation for oral papers and a 10-minute presentation for e-posters, each followed by an additional five minutes for Q&A. Each e-poster talk will run three times during a session, so do some advance preparation to select the ones you want to see, when you're at the symposium put on your headset (yes, there'll be headsets to minimize noise from nearby talks) and jump from booth to booth to enjoy the e-posters. There will be 14 booths equipped with touch-screen monitors where delegates will be able to browse through the various e-posters during breaks any time during the symposium.

Make no mistake, organizing the technical program is a team effort that must work as a well-oiled machine where all the gears need to be in motion. Participants in this team effort range from the authors to the technical committee, and from the local organizing committee in London to the SPWLA office in Houston, and especially Stephanie Turner, who had to work with all the authors and with me on a regular basis. I want to thank the companies that allowed their employees to be part of the TC, and even more to those employers who will be sponsoring the travel time and expense of their presenters to London.

Unfortunately, not all TC members will be able to attend the symposium. I want to express my appreciation to three SPWLA members not on the TC who volunteered to cochair sessions in place of TC members who will be unable to attend.

This may be my last column as VPT but my job is still far from over before my term comes to an end during the symposium. Remaining tasks include ranking the best papers, review presentations and e-posters, and along with the VP Information Technology, spear-heading the introduction of a mobile-device app for the first time during the symposium. Yes, this year we'll use an app to complement the traditional pocket program that you all are used to. We need to accommodate the incoming young blood to the world of petrophysics (I'm talking to you, millennials!).

Figure 1 is a partial list of technical papers scheduled for presentation at the Symposium. Hopefully it won't change!!

See you in London!
Jesús M. Salazar

Letter ID	Title from Abstract	1st Author	Session Topic	Region	Topic Abrev	Type Co	Type	Session
A	Petrophysical Uncertainty Analysis Using Spatial Bootstrapping	Robert K. Mallan	Formation Evaluation of Convention	North America	FECR	IOC	Oral	M1
B	Improved Interpretation of Electrical Resistivity Measurements	Chelsea Newgord	Formation Evaluation of Convention	North America	FECR	ACA	Oral	M1
C	Applications of time lapse LWD to improve petrophysical inter	Liz Davis	Formation Evaluation of Convention	Europe	FECR	IOC	Oral	M1
D	Defining Net Pay Cutoffs in Carbonates Using Advanced Petrop	Mark T Skalinski	Formation Evaluation of Convention	Other	FECR	IOC	Oral	M1
E	Tri-Modal Characterization of Multicomponent Induction Inter	John Quirein	Formation Evaluation of Convention	North America	FECR	SC	Oral	M1
F	Upscaling of digital rock porosities by correlation with whole c	Stefan A. Hertel	Formation Evaluation of Convention	North America	FECR	IOC	Oral	M1
G	A revolutionary X-ray tool for true sourceless density logging w	Matthieu Simon	New Borehole Logging Technology	North America	NBLT	SC	Oral	M2
H	Focused Nuclear Magnetic Resonance	Mark Bacciarelli	New Borehole Logging Technology	Other	NBLT	SC	Oral	M2
I	Unique laboratory setup for improved ultrasonic logging in cas	Tore Lie Sirevaag	New Borehole Logging Technology	Europe	NBLT	ACA	Oral	M2
J	Dielectric permeability logging	Jan Henrik Norbisrath	New Borehole Logging Technology	Other	NBLT	IOC	Oral	M2
K	Fundamental controls of “perched” water conta	Iulian N Hulea	Complex Reservoirs and New Play Ty	Europe	CRNP	IOC	Oral	M3
L	Grain-Size Distribution, Grain Arrangement, and Fluid Transport	Mauro Palavecino	Complex Reservoirs and New Play Ty	North America	CRNP	ACA	Oral	M3
M	Giant Oil Discovery West of Shetland	Chiara Cavalleri	Complex Reservoirs and New Play Ty	Europe	CRNP	SC	Oral	M3
N	Use of Advanced Wireline Logs to Reduce Uncertainties in a Co	Yngve Bolstad Johansen	Complex Reservoirs and New Play Ty	Europe	CRNP	IOC	Oral	M3
O	Pore-type partitioning for complex carbonates: effective versu	Christoph Arns	Complex Reservoirs and New Play Ty	Asia and Austral	CRNP	ACA	Oral	M3
P	QUANTIFYING VOI IN GEOSTEERING: A NORTH SEA CASE STUI	Michael Rabinovich	High Angle/Horizontal Well Evaluatic	Europe	HAHZ	IOC	Oral	T1
Q	3D multi-scale structure and fluids saturation mapping using LV	Frank Antonsen	High Angle/Horizontal Well Evaluatic	Europe	HAHZ	IOC	Oral	T1
R	Sensitivity Study and Uncertainty Qualification of Azimuthal Pr	Hanming Wang	High Angle/Horizontal Well Evaluatic	North America	HAHZ	IOC	Oral	T1
S	Azimuthal Imaging Using Deep-directional Resistivity Measurer	Michael Thiel	High Angle/Horizontal Well Evaluatic	Other	HAHZ	SC	Oral	T1
T	Skewering a pancake: Geosteering challenges in a thinly bedde	Alexandra Love	High Angle/Horizontal Well Evaluatic	Europe	HAHZ	IOC	Oral	T1
U	Field Test Results of a New High-Resolution, Dual-Physics, Logg	Carlos Maeso	New Borehole Logging Technology	Europe	NBLT	SC	Oral	T2
V	USING DIRECTIONAL LWD RESISTIVITY MEASUREMENTS TO A	Andy Ronald	New Borehole Logging Technology	Europe	NBLT	IOC	Oral	T2
W	Advanced Dipole Shear Measurements with a New Logging Wh	Atsushi Oshima	New Borehole Logging Technology	North America	NBLT	SC	Oral	T2
X	A New Ultra-Deep Azimuthal Electromagnetic LWD Sensor for	Hsu-Hsiang Wu	New Borehole Logging Technology	Other	NBLT	SC	Oral	T2
Y	An unsupervised learning algorithm to compute fluid volumes f	Lalitha Venkataramanan	Oil and Gas Data Science and Analyti	North America	OGDSA	SC	Oral	T3
Z	Artificial Intelligence for Prediction of Severe Fluid Losses in Pr	SANDRA BUZINI DUARTE	Oil and Gas Data Science and Analyti	Latin America	OGDSA	NOC	Oral	T3
AA	Advanced Fractal Modelling of Heterogeneous and Anisotropic	Paul W.J. Glover	Oil and Gas Data Science and Analyti	Other	OGDSA	ACA	Oral	T3
BB	Accelerating and Enhancing Petrophysical Analysis with Machir	Ridvan Akkurt	Oil and Gas Data Science and Analyti	Asia and Austral	OGDSA	SC	Oral	T3
CC	Maintaining and Reconstructing In-Situ Saturations: A Compari	Aidan Blount	Formation Evaluation of Unconventi	North America	FEUR	IOC	Oral	T4
DD	Fast Pressure-Decay Permeability Measurement for Intact Tigh	Zheng Gan	Formation Evaluation of Unconventi	North America	FEUR	SC	Oral	T4
EE	Calculated Determination of Variable Wettability in the Middle	Richard Merkel	Formation Evaluation of Unconventi	North America	FEUR	CONS	Oral	T4
FF	Experimental Quantification of Kerogen Wettability as a Functi	Archana Jagadisan	Formation Evaluation of Unconventi	North America	FEUR	ACA	Oral	T4
GG	Natih B Carbonate Source Rock: Resource Assessment to Prod	Labib Mohsin	Formation Evaluation of Unconventi	Middle East and	FEUR	NOC	Oral	T4
HH	Robust Vuggy Dolomite Pore Typing and Quantification with LV	Songhua Chen	Nuclear Magnetic Resonance	Middle East and	NMR	SC	Oral	W1
II	Reducing the uncertainty of Porosity, Saturation and Completi	Sunday Adole	Nuclear Magnetic Resonance	Middle East and	NMR	IOC	Oral	W1
JJ	Temperature dependence of 2D NMR T1-T2 maps of shale roc	Ravinath Kausik	Nuclear Magnetic Resonance	North America	NMR	SC	Oral	W1
KK	An Integrated Workflow to Estimate Permeability Through Qua	Artur Posenato Garcia	Nuclear Magnetic Resonance	North America	NMR	ACA	Oral	W1
LL	Slimhole NMR T1 Logging While Drilling Enhances Real-time Pe	Gabor Hursan	Nuclear Magnetic Resonance	Middle East and	NMR	NOC	Oral	W1
MM	Novel Smart Cement for Improved Well Integrity Evaluation	Hani Elshahawi	Reservoir and Production Surveillanc	North America	RPS	IOC	Oral	W2
NN	PETROPHYSICAL SURVEILLANCE - THE KEY DRIVER IN OPTIMIS	Maryam A. Mousavi	Reservoir and Production Surveillanc	North America	RPS	IOC	Oral	W2
OO	Identification of Bypassed Hydrocarbon through the integratio	Luis F Quintero	Reservoir and Production Surveillanc	Other	RPS	SC	Oral	W2
PP	Using Temperature measurements from Production Logging or	D. Zhu	Reservoir and Production Surveillanc	North America	RPS	ACA	Oral	W2
QQ	Extracting Rock Cation Exchange Capacity from Electromagnet	Ping Zhang	Formation Evaluation of Convention	Middle East and	FECR	SC	Oral	W3
RR	An Integrated Formation Evaluation Approach to Characterize	Graham Davis	Formation Evaluation of Convention	Europe	FECR	IOC	Oral	W3
SS	Interpreting the Whole Well	Christopher Skelt	Formation Evaluation of Convention	Other	FECR	IOC	Oral	W3
TT	An Experimental Multi-Physics Method for Quantifying Cation I	Kai Cheng	Formation Evaluation of Convention	North America	FECR	ACA	Oral	W3
UU	Constraining uncertainty in complex reservoir description - a ca	John Y Banks	Formation Evaluation of Convention	Europe	FECR	IOC	Oral	W3
VV	Production Petrophysics in Liverpool Bay Asset. The driver for a	James Bunce	Reservoir Characterization Case Stud	Europe	RCCS	IOC	Oral	W4
WW	Petrophysics-Driven CO2 EOR Scoping Study: A Field Case Dem	ANAND SELVEINDRAN	Reservoir Characterization Case Stud	North America	RCCS	ACA	Oral	W4
XX	Upscaling of Saturation-Height Functions	Alan Johnson	Reservoir Characterization Case Stud	Europe	RCCS	CONS	Oral	W4
YY	High-Resolution Hyperspectral Imaging Technology: Subsurface	Tobi Kosanke	Reservoir Characterization Case Stud	North America	RCCS	SC	Oral	W4
ZZ	Determining the Formation Properties and Hoop Stresses with	Farrukh Hamza	Complex Reservoirs and New Play Ty	Asia and Austral	CRNP	SC	Poster	MA
AAA	Advances in NMR Fluid Typing Assist in the Petrophysical Evalu	Pedro A. Romero Rojas	Complex Reservoirs and New Play Ty	Latin America	CRNP	SC	Poster	MA
BBB	Integrated Interpretation of Multi-Frequency Dielectric Dispers	Artur Posenato Garcia	Formation Evaluation of Convention	North America	FECR	ACA	Poster	MA
CCC	Estimation of Sw from NMR T2 Logging	Chanh Cao Minh	Formation Evaluation of Convention	Asia and Austral	FECR	SC	Poster	MA
DDD	NOVEL ESTIMATION OF RESERVOIR FLUID COMPOSITION USI	Vitor Villar de Andrade e Sil	Formation Evaluation of Convention	Other	FECR	SC	Poster	MA
EEE	Downhole Fluid Analysis Combined with Gas Chromatography:	Oliver C. Mullins	Formation Evaluation of Convention	Other	FECR	SC	Poster	MA
FFF	Enhancing Reservoir Rock Mechanical Characterization	Syed Shujath Ali	Formation Evaluation of Convention	Middle East and	FECR	SC	Poster	MA

Fig. 1—Partial lineup of the papers selected for presentation at the SPWLA 59th Annual Symposium. Oral means presentation in the auditorium and Posters means e-poster presentations, respectively. I leave it up to the reader to figure out the remaining acronyms.

Informative Technology

Mehrnoosh Saneifar
2017–2018 Vice President
Information Technology

Dear SPWLA Members,

I have been focused on launching a new and a more professional look for the SPWLA website that would create smoother navigation through the SPWLA information for our members and other visitors. The constructive feedback I have received from our members has been incorporated in the changes made to the website. This work is ongoing. We look forward to receiving additional feedback from our members on the new website once it is launched.

Another area of focus for me has been the 2018 SPWLA Symposium mobile application. We are at the point where we are ready to upload the symposium information and the technical program on the app. Once that is complete, we will submit the app to the Apple and Google stores for approval and publication.

Along with my other duties, I continue to host and facilitate the monthly webinars and our distance-learning program.

Please feel free to email me your feedback and ideas for improvement via VP-InfoTech@spwla.org.

Jennifer Market
Vice President Finance

The SPWLA strives to be a transparent organization. One of the ways to help ensure transparency to the organization is to share the financial numbers. Prior to ~2010, this was done by publishing a summary of the financials in the *Petrophysics* journal. However, this led to fraud being perpetrated against the SPWLA. (Criminals printed out the financial sheets, made up false identities showing them to be members of the board of directors, and charged goods and services, promising payment. The creditors that accepted these false credentials then came to the SPWLA office trying to be paid). This fraud not only caused legal fees, but also led to our being advised to not make our detailed financials so easily accessible to nonmembers. Thus, we have been considering the best way to ensure transparency without leading to fraud. To this end, the numbers below reflect the Society's income and expenses in terms of percentages of bank balance at the beginning of the 2016 fiscal year. In this manner, we avoid potential fraud issues and are still able to share the income and expense numbers.

Please be aware that the fiscal year runs from May to April while the conference and the SPWLA board tenure runs from June to May, so there are some expenses that appear in the current (2017–2018) fiscal year that are remnants of the previous SPWLA year. In addition, there are significant symposium expenses/income that span multiple terms but I have gathered the cost/income from each year's symposium together in the income column for ease of viewing.

With the downturn of the industry, the SPWLA finances have become strained. The majority of the income is due to membership fees, advertising in the journal, and the annual conference, all of which have been significantly reduced in recent years. The majority of the expenses are staff costs and the publication of *Petrophysics* (the journal), which have remained largely flat. Thus, in recent years, the costs have exceeded the income by more than 10% of our balance. The board is eager to not only continue existing programs, but also expand to offer more services, such as the recently introduced webinars and distinguished speaker travel fund. We would like to expand the student programs but funds are too limited to do much in this area at present. Thus, the board is working to try to reduce costs and expand income in order to continue to provide existing services and expand new programs. Some of these measures are:

- ***Petrophysics***. All full members will receive the (expanded) digital version of the journal, but in order to offset a portion of the print and mailing costs, we have had to add an additional fee of $25 for those who wish to receive a printed copy (the actual average cost per member to print and ship the hard copies is closer to $60). This will be reviewed again in the 2018–2019 year when we consider how many members opt of the hard copy this year.
- **Dues**. Dues were increased in the previous year to this year. Our members often ask why membership fees for a relatively small society are similar to, or even marginally higher than the larger societies like SPE, SEG, and AAPG. The answer is that the larger societies (which have ~10 to 100 times our membership) operate on an economy of scale that we are too small to take advantage of. If we could double the membership of the SPWLA, we could decrease the dues and still provide the same services
- **Advertising.** We are looking to expand our online and digital journal advertising. We plan to roll out new advertising opportunities on the website in the first quarter of 2018.
- **Houston Training Center.** The SPWLA headquarters operates a training center that not only offers SPWLA-hosted courses, but is also available for hire as a meeting venue. (For information, contact Sharon@spwla.org)

	May 2016–April 2017 (% of May 2016 Starting Balance)	May 2017–May 2018 (% of May 2016 Starting Balance)
Starting Balance	100	88.47
	0.64	0.09
	0.74	0.43
	3.30	2.86
	11.89	11.64
	0.63	7.23
	–0.43	1.49
	0.19	0.51
	3.50	3.85
	1.80	0.34
	22.27	**28.44**
	16.00	11.62
	11.28	10.41
	3.28	1.71
	3.55	3.33
	0.13	–0.05
	1.24	1.01
	0.94	0.06
	35.48	**28.02**
Net Profit (% of 2017 Starting Balance	–13.21	0.42
Balance at End of Period	**89**	**84**

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The Thomas-Stieber Shaly Sand Model Revisited

David Kennedy

"Shale: a fissile rock that is formed by the consolidation of clay, mud, or silt, has a finely stratified or laminated structure." Merriam Webster online dictionary(https://www.merriam-webster.com/dictionary/shale)

This spring I am teaching the "Advanced Formation Evaluation" course (PETE 608) in the Petroleum Engineering Department, at Texas A&M. In such a course, the interesting topic of well-log interpretation in clay-bearing reservoirs (known in our patois as "shaly sands") cannot be avoided. It is encoded in my particular copy of the human DNA molecule to want to examine foundations, and I have previously coauthored a conference paper titled "On the Quagmire of Shaly Sand Saturation Equations" (Herrick and Kennedy, 2009), that details the unsteady ground upon which these models stand. More recently, I have dug even deeper into the past, examining the original efforts to put Archie's model onto a sound theoretical footing in the paper "Foundational Flaws in Modern Petrophysics" (Kennedy et al., 2016).

The problem of accounting for the effects of a conductive mineral component in conventional reservoir rocks was addressed as early as 1949 by H.W. Patnode and M.R.J. Wyllie (Patnode and Wyllie, 1950). Wyllie contributed twice more on the topic, in 1952 and 1954. In his 1952 paper, Wyllie observes "the presence of clay or shale in permeable rocks such as sandstones or limestones constitutes a major bane." Indeed. But Wyllie's ideas on this topic gained no lasting traction at the time, or subsequently.

Interest was renewed with the 1968 publication by Waxman and Smits of their study "Electrical Conductivities in Oil-Bearing Sands." With what, at the time, was accepted as a rigorous theoretical model for how electrical conduction in oil-bearing reservoir rocks behaved, it became necessary to distinguish among types of conductive rocks to which the Waxman-Smits might, or might not, apply. The purpose of Thomas and Stieber (1975) in their paper was to classify how porosity was affected in a shale-rich environment, rather than an application to analysis of formation conductivity. (They do use a parallel conductivity model: the laminated portions of the reservoir that they analyze, but no other shaly sand conductivity model is used.) It is on the basis of their classification of shaly sands that I want to initiate a discussion.

What has launched this discussion is the use in a classroom presentation of two beautiful graphics illustrating how the Thomas-Stieber model has come to be understood and used in contemporary formation evaluation (Figs. 1 and 2).

The Thomas-Stieber model posits that shale in reservoir rocks can be distributed in three ways:

1. "laminated – layers of shale within the sand"
2. "dispersed – shale on the sand grains, or pore filling";
3. "structural – sand-sized shale particles in load-bearing positions within the rock."

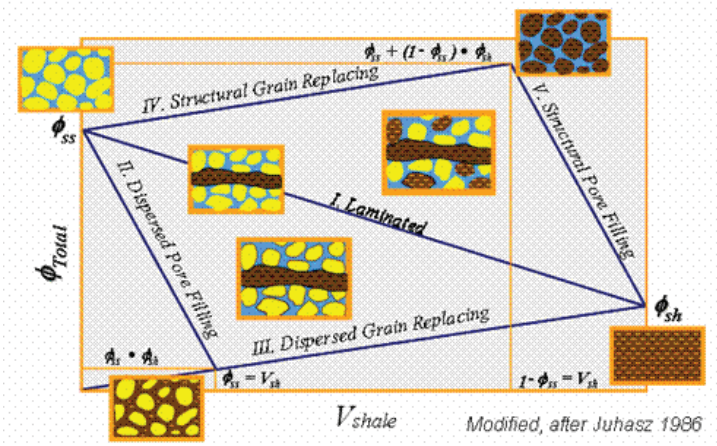

Fig. 1—Thomas-Steiber shale distribution model (Tyagi et al., 2009; modified after Juhasz, 1986).

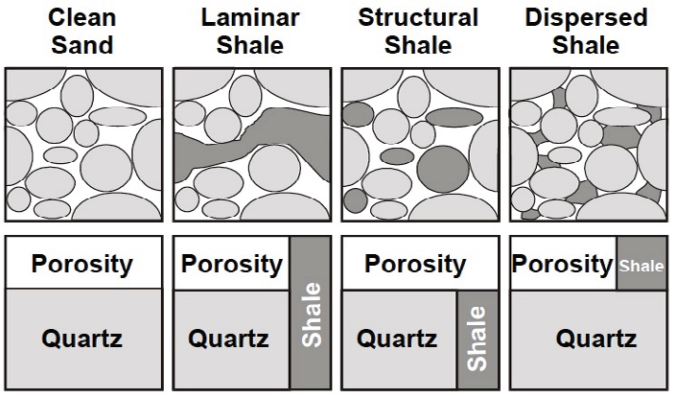

Fig. 2—Different modes of clay distribution in a reservoir (Glover, 2014).

Thomas and Stieber are aware of the difference between clay and shale. They state the following "The components of the system are sand and shale, thus, we have chosen to use shale rather than clay minerals, even though it is the clay which contains the bulk of the radioactive[1] material. … The differentiation between sands and shales begins as the particles settle at differing rates according to their size and transport energy, and not mineral type. … Thus, we feel the porosity destroying material introduced into a sand stratum will be of the same composition as the shales above and below the sand stratum." I think they have this picture absolutely right except for their choice of nomenclature. They provided no artwork in their paper. This gave subsequent users and expositors of their model license to provide their own conceptions of the meaning of the three definitions, and it is these ex post facto illustrations that have given us a misleading

[1] Thomas and Stieber are using natural gamma rays to quantify the degree to which pores are filled by clay, which as they say, they are choosing to refer to as "shale".

picture of the distribution of, and confusion between, shale and clay in our reservoir rocks.

Let us revisit the deposition of sediments in a clay-rich environment likely to produce thin layers of alternating shale and sand. The environment is likely fluvial or deltaic or turbidite prone. The particles that will eventually become the rocks of interest, are clasts borne as the bed load of a flowing layer of water at the bottom of a watercourse of one kind or another. In this collection are clasts of various sizes, the maximum size depending upon the flow rate. There will be sand grains (of all sizes including silt) and clay mineral grains (of uniformly small size). The current may both erode the bed, picking up additional material, or deposit new material on the existing substrate, depending upon its speed. Some of this additional material may be in the form of shale clasts, but a shale clast transported as bed load would disaggregate before it has traveled far from its source. It is extremely unlikely that shale could survive as a grain-sized, load-bearing rock (shale rip-up clasts are much larger).

It is the accumulation of new deposits on existing substrates that have managed to avoid subsequent erosion that we observe today as reservoir rocks. Some of these rocks meet the definition of shales: they are fine-grained fissile ductile collections of silts (that is, clay-sized particles of quartz or other durable, rock-forming minerals) and clay. The thickness of a shale lamination depends upon how long the depositional conditions that produce it persist. It is deposited in a low-energy stream lacking the energy to transport larger sand grains and, indeed, without the energy to transport the silt and clay any farther than where they fall out of the bed load. And so, a layer meeting the definition of shale is produced.

To get a sand layer on top of a shale layer, conditions at the location must change. The main change is in the speed of the stream; at a high enough speed sand grains become part of the bed load, and available to fall out of the stream and contribute to a sand layer. If there were going to be shale "dispersed" in this rock, then the shale would have to exist in particles small enough to occupy the pore space between the grains. In other words, there would have to be "shale" particles smaller than the sand grains. I would have to be shown that this is possible; it is much more likely that before a shale "rock" could become this small it would be totally disaggregated into its constituent silt and clay-mineral clasts.

We have innumerable examples of the deposition of alternating shale and sand layers; their existence is an observable and undeniable fact of nature. Layering occurs at all scales, but to qualify as laminated shaly sands the requirement is that the layering of the alternating shale and sand be below the resolving power of logging instruments whose responses will be a volume-weighted averages of the properties within their volumes of investigation.

When we see cartoon images of "dispersed" shale, subdivided into three subtypes of pore lining, pore filling, and pore bridging (Fig. 3), what appears in the cartoons more resembles authigenic grain coatings (pore lining) and other authigenic clay growths. Of course, since the bed load that precipitated the sand did indeed contain individual clay mineral crystals, they would also be expected to be present. They might even be the particles that the authigenic clays nucleated upon. However, in this more realistic picture, there is nothing that can be called shale. Outside the world of cartoons, we have many thousands of SEM examples of pore spaces containing an almost bewildering variety of clay minerals. I have never seen a shale particle in an SEM image.

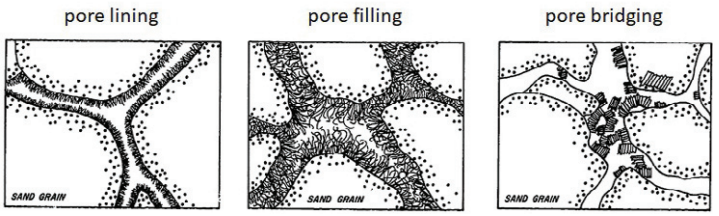

Fig. 3—Cartoons showing 'dispersed' shale subdivided into subtypes (Neasham, 1977).

The other mode of shale distribution posited in the Thomas-Stieber model is "structural" shale. These are "shale grains" of the same size as the rock-forming mineral grains, and taking the place of some of them. I return to the definition of shale as fine-grained and fissile; not being a crystal it is also soft and ductile. I have already argued that a grain-sized (or smaller) shale clast is unlikely to survive the rigors of transport in an energy environment high enough to transport sand. Even allowing that this might happen, once a load were applied to such a grain, it would disintegrate and disaggregate into its individual clay-sized particles which would become shoved into the remaining pore space by compaction, becoming indistinguishable from the particles in the "dispersed" model. Structural shales as depicted in the cartoon representations do not exist. I have certainly not seen an actual image of one, i.e., thin section or SEM.

Quoting from the Thomas-Stieber paper in the interpretation section: "… One simplification is to assume the amount of structural shale is too small to be significant…" They are silent as to why the amount of structural shale would be insignificant; we have to let the words speak for themselves.

In summary, I have little to criticize in the actual model of Thomas and Stieber other than their choice of nomenclature. Had they chosen to use "clay" instead of "shale" it would be impossible to argue that there is not dispersed clay in the pore space of rocks in a clay rich environment. They probably would not have included a "structural clay", such a thing seemingly not possible to imagine. It is the subsequent illumination of the model with beautiful, but fictional, illustrations of shale in pore spaces and taking the place of grains that could use a paradigm shift.

If I were granted a wish to magically change one thing in the formation evaluation community, it would be that it would learn to argue vigorously over the introduction of every new idea, until for each idea its merits and limitations are thoroughly explored and well understood by the entire community, and documented

for future practitioners of formation evaluation.

I have offered my unvarnished opinion on the Thomas-Stieber model bolstered by arguments from geology. I cannot close without issuing an invitation for readers who have evidence to the contrary to come forward and offer it. I am a stubborn and opinionated person and have been in error, or just plain wrong, about many things, many times (just ask Mrs. Kennedy). But I am not immune to receiving new facts, arguments, and ideas. If I am wrong, please use the pages of this publication to educate me and other benighted formation evaluators. Let's start a discussion.

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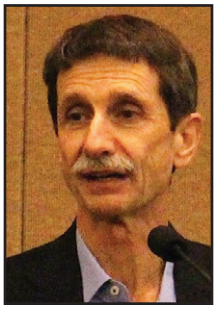
Can We Propel Cuttings-Based Mud Logging Into the 21st Century?



Daniel Georgi

Ton Loermans

More than a couple of decades ago, we got our separate introductions to mud logging, which have shaped our view of mud logging. For example, there was an effort in one of the largest IOC's in the world to identify a heavy-oil contact in an offshore reservoir using the wireline NML (Nuclear Magnetic Log) tool. This was successful but involved a "doping" run to kill the mud signal and several passes with the NML tool and lots of analysis. (Admittedly, today's modern NMR (nuclear magnetic resonance) tools can detect the heavy-oil contacts easily; however, that does not preclude the need to drill through and beyond to log the contact.) Shortly after the "successful" demonstration of the use of the NML tool, a mud-logging effort within the company that involved catching cuttings and extracting the crude oil and estimating the viscosity proved both simple and reliable and results were available almost instantaneously. The cuttings-based analysis required only that the cuttings be circulated to the surface for the analysis; no rathole was needed to log the contact.

A couple of years later, somebody recruited from an IOC into the largest core analysis company to lead their research program was instructed by his new boss to review all the research projects and decide which to continue; he was further instructed as part of that effort, to make sure that at least the cuttings collection project be "killed". The director dutifully reviewed all the projects but alas came to the conclusion that automated cuttings collection actually offered a unique opportunity to bring more rock material to the labs for analysis and ought to increase lab-based revenues. So the project was continued, and subsequently there was a very successful demonstration in the Groningen field (Georgi et al., 1993). However, the Achilles heel for cuttings analysis is that one requires cuttings that are typically large enough to incorporate 20 to 100 grains. Unfortunately, at the same time as the automated cuttings collection equipment was perfected PDC bits (polycrystalline diamond compact bits) were starting to dominate the bit market, and PDC bits, with their shearing action, generate rock-flour cuttings that are unsuitable for most laboratory analysis.

The prevalence of PDC bits coupled with the prolonged downturn in the industry, which lasted through the 1990s severely dampened research on cuttings. Nevertheless, the industry did perfect gas traps and significantly improve routine mud-gas analyses. In the 1990s, we also saw the introduction of a new generation of wireline tools, including permanent magnet NMR, 3D induction and neutron-induced gamma-ray spectroscopy mineralogy tools, which significantly increased the number and types of measurements available to petrophysicists. Today, most of these advances are routinely available in LWD measurements. However, when we consider actual rock measurements, clearly the miniaturization that has taken place in many other lines of business, took much longer in the oil business. For most measurements on rock samples, cores, i.e. core plugs, preferably large ones, are still the preferred source of information, but of course coring is both expensive and time consuming, especially in horizontal wells. And it is only relatively recently that advanced cuttings analysis has been introduced into the mud-logging business. To us this suggests that we should just spend a little more effort to generate, gather and use cuttings. Today's underdeveloped measurement techniques on small rock fragments means that with just a little further effort significant gains can be made.

From our perspective there have been several advances that should make cuttings a viable source of critical petrophysical data, for example:

1. Special PDC bits, "dream bits" or "missing tooth bits," can generate a small fraction of larger cuttings without impacting rate of penetration (Deschamps et al., 2008; Desmette et al., 2008).
2. Cuttings of relatively uniform size are transported with minimal dispersion, even in horizontal wells (Georgi et al., 1993).
3. Cuttings can be collected systematically and automatically (Georgi et al., 1993).
4. Cuttings can be tagged to determine their measured depth origin (Hammer and Clapper, 2012).
5. Direct determination of mineralogy from micro-XRF measurements (Marsala et al., 2011).
6. Direct determination of acoustic velocity from cuttings (Santarelli et al., 1998).
7. Analysis of cuttings using X-ray CT imaging (Siddique et al., 2005), perhaps combined with new improved high-resolution X-ray CT equipment combined with new exact tomographic inversion (Katsevich, 2002; Katsevich et al., 2015).
8. NMR analysis of cuttings (Wang et al., 2007).
9. Source-rock analysis of cuttings (Hunt, 1996).

Cuttings can add significant value especially for unconventional reservoirs where routine LWD and WLL (wireline logging) petrophysical measurements have not proven

particularly useful as they fail to provide critical organic-matter content and maturity as well as the hydrocarbons in-place data needed to really assess the play and guide the completions. The fact that many nonconventional operators are turning away from LWD/WLL logging is not just an economic cost-based decision; it might be hard to swallow, but apparently, too often the existing LWD/WLL techniques are not answering the main questions being asked.

Impediments. Both operators and service companies have reasons to not pursue cuttings collection and analysis: major service companies have financial conflicts associated with their LWD/WLL that, in our opinion, are not good for mud-logging services. In the early days of LWD, LWD was seen as a threat to WLL revenue, but with the current lack of LWD and WLL in unconventionals resource plays, mud logging based on cuttings should not be seen as threat; nevertheless … We note at the last SPWLA symposium in Oklahoma City, Haecker et al., (2017) ingeniously determined the variation of lateral properties along a lateral from near-bit accelerometer data captured in a downhole data module. During the presentation it was remarked that no other wireline or LWD data were being collected; thank goodness they still had the pipe tally data to determine measured depth. They also were able to process the data to extract a fracture indicator. However, there was no mention of variations in organic-matter content or possible changes in maturity along the borehole.

Suggested Way Forward. We believe that there still is a need for formation evaluation even in unconventionals and that generation and collection of cuttings and analysis can provide valuable data. How to move forward? Perhaps via an industry consortium to test an integrated approach to mud logging, including:

- Cuttings generating PDC bits
- Tagging cuttings for depth control
- Routine/automated collection of cuttings
- State of the art gas mud logging
- Wellsite and laboratory cuttings analysis
  - Organic component (TOC, maturity etc.)
  - Porosity determination (NMR and CT scanning)
  - Mineralogy (inorganic component)
  - GRI porosity and permeability on cuttings
  - SEM and FIB SEM (image data and computed petrophysical properties)

Conclusion. Our main message is that to advance mud logging, especially cuttings analysis, one needs an all-inclusive approach: generate cuttings even with PDC bits; tag the cuttings for depth control; collect the cuttings of a fixed, limited-size fraction to minimize dispersion; and finally, employ regular and, ideally, automated sample collection. If we do not take care of the basics, then even the most sophisticated new technology will not advance cuttings analysis nor will it provide useful petrophysical information.

Should you be interested in forming and/or supporting a "complete" advanced mud-logging consortium or JIP please let us know (ton_loermans@hotmail.com or dan.geo2013@gmail.com) or propose something that others can join.

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A Brief History of Depth (and one of the many possible future scenarios)

Ton Loermans

In prehistoric times, when, by implication and definition, wireline logging didn't exist yet, there was, of course, only one depth. Nowadays you'd think of that as "driller's" depth, but being the one and only one, of course no such label was added then. Maybe it's not needless to say that in those days drillers were generally good in arithmetic, and furthermore were not only meticulous in counting the number of pipes going into a well and keeping good pipe tallies, but similarly concerned about keeping their tape measures well oiled and in tip-top shape. Hence, apart from the odd case of some little hiccup, their depth was generally accepted as the One True Depth.

In the baby years of wireline logging (WLL), it obviously had to prove its competence on all aspects of the trade, first and foremost spontaneous potential (SP) and resistivity, depth, understandably, only second: why worry when there already is an undisputed True Depth? And it won't surprise anybody that, without any doubt about that One True Depth from the drillers, the focus of WLL was on the other measurements. Consequently, it was a challenge to get industry to accept WLL depths, which were obtained using a 'flimsy' cable versus carefully measured solid steel drillpipe. Cables stretched in manners not fathomed yet, actual steel tape measures, too flimsy as we later learned from experience, lowered into wells stretched even more, wheels slipped and/or were too inaccurate to begin with etc. The state-of-the-art in the year AS 11 (Anno Schlumberger) can be distilled clearly from Reistle and Sikes (1938). They confirmed that at that time WLL depth was not to be trusted at all. Clearly, in those days WLL depth didn't even have, let alone deserve, a name for itself yet. Whenever any operator wanted to make sure anything was done on depth, e.g., putting a packer in the right place or shooting perforating guns on depth, one would have the driller put a plug on the right spot downhole and then tell the logger to go and sit on it and start from that.

Archie (1942), publishing his groundbreaking paper just a few years later, i.e., in AS 15, isn't known by many people to have worried much about WLL depth. Hence we can do little more but speculate on how far exactly WLL depth had evolved by his time and in his part of the world. And with war then raging in Europe, people there had other things to do than worry about depth. For example, explorationists and drillers together were concocting the best ways to prevent, or at least delay, the occupying enemy from discovering the largest, giant, Western European oil field, using shrewd tactics, while claiming of course to be as "grundlich" as the character of the occupier prescribed, on some exploration wells drilled right in the middle of that giant field. With the results of their efforts plainly obvious for anybody looking at the field map or some of the relevant drilling reports.

But a few decades later, after more than 50 years of WLL, clearly, it appeared, all of a sudden, as it may seem to some, that not only had WLL reached maturity and adulthood, but WLL depth had even become King! Having crawled and wrestled its way up from that infant and underdog position it started in. Drillers, around AS 60, apparently, were no longer trusted as being able to even count the number of pipes going into the hole, let alone measure them as meticulously as it should be done. Any and everybody in the business, and all the national stake holders and regulators, used, and believed, Logger's Depth was the One True Depth which could, most of the times, be trusted blindly. (Having said that, in many a situation when TVD depths, a product of WLL depths and deviation, did not fit with the petroleum engineering model of a field, the logs were deemed to be in error and happily shifted, without as much as a relog, let alone a sleepness night from many of petrophysicists involved.)

Note that in those days, say from AS 50 to AS 70, maybe 75, WLL depth actually was a complete measurement, in ISO terms, where the log quality control (LQC) books sort of promised, what in current day metrology terms is called trueness, of better than 5 per 10,000[1]. And, barring the odd, again ISO terminology, blunder, the WLL depths were mostly accepted and believed to have such trueness, or if not at worst a smallish factor worse. And all of that pretty good state of affairs was made possible by a significant effort over the previous decades, introducing ever better equipment, sound procedures and stretch corrections, for vertical wells, and logging operations QM/QA (quality management/quality assurance).

But, alas for Depth, with WLL still being King, Drillers advanced and deviated "their" wells more and more, while this King did not follow by enhancing the stretch-correction routines. Apparently happy to keep collecting about a dollar per foot as depth charge, for any and every log, without making the necessary effort to continue any trueness promise commensurate with that still royal status.

Apart from these concerns being raised about stretch correction for less than perfectly vertical wells, just too many incidents started popping up where WLL didn't seem as good as it should be. Thus, around AS 70, a Quest for Depth improvement was started with two objectives (1) an improved audit trail and record of quality indicators, and (2) a quantification of the uncertainty of (logger's) depth on a well by well basis. The latter of course because that narrow

[1] Readers surprised by this Qlaim are referred to the relevant parts of Philippe Theys' books (Theys, 1999; 2011). To confirm that indeed, while the term trueness in those days wasn't used in our discipline yet, the commonly held understanding or belief of the Quality of WLL depth involved such trueness.

blanket trueness range of a few per 10,000, could no longer be maintained. And while some significant improvement was made across the board for the first objective, unfortunately, very little, i.e., nothing, of the second objective materialized.

Alas, also, as it goes too often with powerful Kings, things go downhill. Indeed, after about AS 75, WLL Depth (and many other 'things') were degraded from 'measurements' to merely 'recorded data'. Just compare the standard disclaimer on all log prints from some major service companies from the heydays with current terminology (Fig. 1) and the relevant ISO definitions. As ISO and any metrologist define: something without an uncertainty/(un)-trueness quantification shouldn't be called a measurement. The lawyers of (at least most of) the service companies apparently have been aware of this and their safeguards are in place. Such legal solution is apparently cheaper than the 'proper', engineering approach of actually providing what we all learned at school and, again, ISO spells out as being necessary to be allowed to imply a complete measurement is made: a quantification of uncertainty.

But the worst was still to come: LWD on Driller's Depth. Everybody knows that Driller's Depth is not corrected for anything and is thus very untrue. And that just a little variation in weight on bit (WOB) can easily make many feet of drillpipe at the surface going into or coming out of the hole, resulting in an apparent change in depth, without the bit moving very much at all. Just like depth errors with wireline in very bad slip-stick situations. However, LWD invoices normally more under the control of entities focused on short-term operations, where little more is needed than an "address" to identify a downhole location, rather than a numerically quantified depth, operational convenience prevailed over the needs of true and precise field models. And, apparently, Operators don't consider depth important enough to do better.

History concluded in the above, we will provide one possible future, rather than a futuristic, scenario. Let us assume the reason for Operators apparently not being interested in complete measurements of depth, i.e., not wanting to expend that little bit of effort to determine a True Along Hole depth, stemming from too short a time frame used in their economic evaluations. In countries where the ownership of downhole resources rests with the State, having a much longer-term view, it might be the Regulators who could insist that Operators base any reported depth on a complete measurement. And we predict that once those uncertainties are properly quantified, the necessary steps to narrow those, if and when needed, will take place on their own.

Ton Loermans: ton_loermans@hotmail.com

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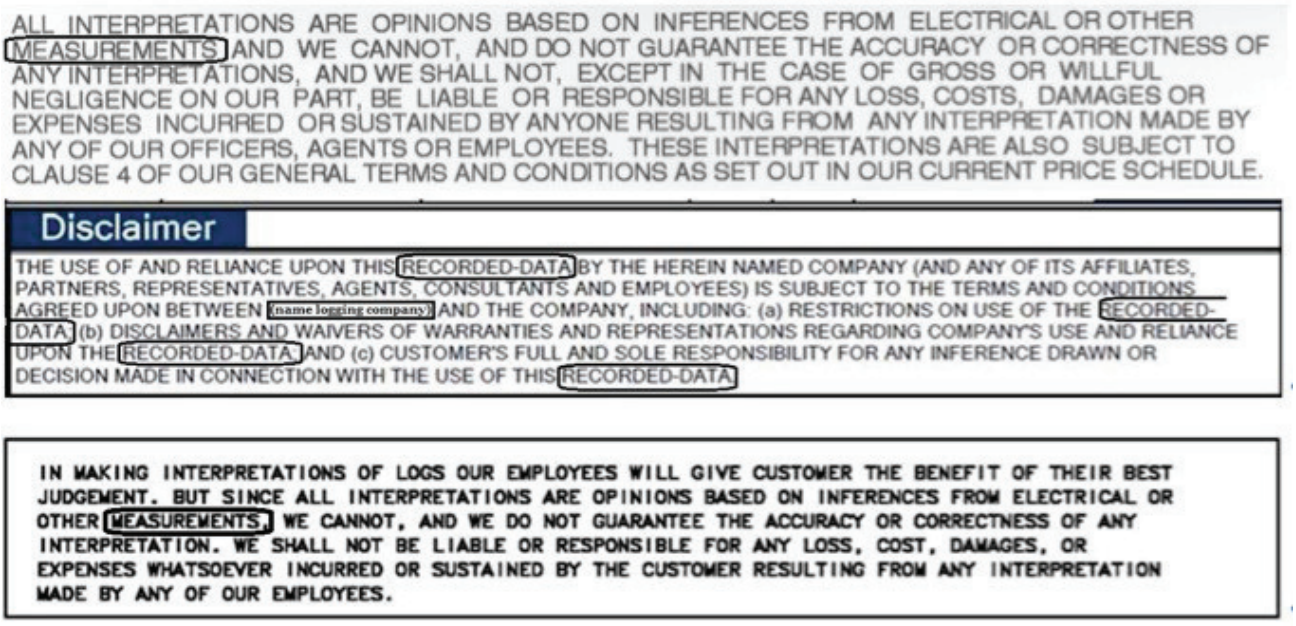


Fig. 1—Typical disclaimers on log prints. Top: WLL, 1992. Center: WLL and LWD, same company as top, 2014. Bottom: Different company from top and center 2014. Note the differences in use of the term "measurement" and "recorded data."

An Oilfield Fairy Tale

Philippe Theys

Some elements of this story may be fictitious, but some may be real.

Once upon a time…..

There was an exploration well, SmallGusher#4, in a country called Xanadu, where no oil or gas had ever been discovered. As the local oil company did not want to miss any possible hydrocarbons, the well was cored from surface to total depth. And, joy, some minute traces of oil were observed on the core.

Enter the logging engineer and the geologist. The geologist told the logging engineer. "You see this core description reporting hydrocarbons. Well, I want your logs to show these hydrocarbons." The (then) young logging engineer answered. "I cannot tell my logs to show whatever you want. The instruments have a life of their own and they show what THEY want."

The logs did not show any hydrocarbons. The oil company did not trust the logs and decided to perforate the whole well from the previous (and shallow) casing shoe to the bottom of the well. Once the well was perforated, the oil company tested the well. Nothing flowed. The oil company explained that the shaped charges were phased 0° (and they all shot the casing in the same direction) and that the oil must be in the opposite direction. The oil company required that the well be perforated again with the shaped charges phased alternatively 0° and 180°.

The technically oriented reader could imagine the look of the post-perforating casing-collar locator survey over the perforating interval after two perforating jobs: A full track over 10 divisions. He could also quickly figure out the very sizeable bonus earned by the logging engineer. Twice tens of meters of perforation meant big bucks.

The oil company tested again. And, miracle, the well flowed … a little. About 70 gallons! The amount was so minute that the barrel unit was not used. Journalists invaded the wellsite and next morning the newspapers printed: SmallGusher#4, the Xanadu KUWAIT! The oil company top boss appeared on television and proudly displayed a small flask of the cherished fluid "We found oil."

Epilogue. The logging engineer explained to the geologist. "I am a bit surprised. In my training, I was not told that so minute amounts of hydrocarbons were the target. From a quick accounting, I figured that each barrel of oil must have cost several tens of thousands of dollars." The geologist answered: "You do not get it. The citizens of this country are so jealous of their neighbors, who live in Brobdingnag and produce thousands of barrels per day on a single well. They just want to have a plastic display cube with a drop of Xanadu oil to prove that Xanadu, too, has oil."

Note: I am thanking Jonathan Swift and Marco Polo for the borrowing of the names Brobdingnag and Xanadu, for this utterly fictitious fairy tale.

Oliver Mullins

Oliver C. Mullins, a Schlumberger Fellow in the Reservoir Characterization Group, Houston, former editor of *Petrophysics* and frequent presenter at SPWLA symposiums, has been elected a member of the US National Academy of Engineering in 2018. The NAE citation of the contributions leading to his induction: "For developing downhole fluid analysis of oil and gas reservoirs, and elucidating the structure of asphaltenes in crude oils." This recognition reflects very favorably on petrophysics and formation testing; the advances within this community are being recognized broadly across the many engineering disciplines. Dr. Mullins also received the 2018 George A. Olah Award in Hydrocarbon or Petroleum Chemistry from the American Chemical Society (ACS). (See The Bridge section for an expanded biography).

Lu Chi

Zoya Heidari

Lu Chi and **Zoya Heidari** are the winners of the 2017 SPE Cedric K. Ferguson Medal. The SPE Cedric K. Ferguson Medal is an international award recognizing professional achievement in petroleum engineering. The medal is presented for the paper written by an SPE member age 35 and under at the time the paper was peer-approved. SPE considers all papers published in SPE journals and presents the award for the best paper. Chi and Heidari received this award for their 2016 paper (SPE-179734) "Directional-Permeability Assessment in Formations with Complex Pore Geometry With a New Nuclear-Magnetic-Resonance-Based Permeability Model," which was published in *SPE Journal,* **21**(4), 1436–1449. DOI: 10.2118/179734-PA.

Lu Chi is a research scientist and US representative at iRock Technologies. She has more than 10 years of experience in research and development, with a present focus on digital rock physics, nuclear magnetic resonance petrophysics, and log and core analysis. She has been a technical reviewer for various journals, including *SPE Journal and Petrophysics,* and the organizer and assistant editor of a special section for SEG interpretation from 2015 to 2017. Lu holds a BS in physics from Peking University, an MS in material science from the University of North Carolina at Chapel Hill, and a PhD in petroleum engineering from Texas A&M University.

Zoya Heidari is an assistant professor of petroleum and geosystems engineering at the University of Texas at Austin. Before joining UT-Austin, she was an assistant professor of petroleum engineering at Texas A&M University. She was the founder and director of the Texas A&M joint industry research program on multiscale formation evaluation and unconventional and carbonate reservoirs from 2012 to 2015. She founded and has been the director of the UT-Austin industry-affiliated research program on multiscale rock physics since 2016. An associate editor for the *SPE Reservoir Evaluation and Engineering Journal,* Zoya has published more than 100 papers in peer-reviewed journals and conference proceedings. She received the SPE Regional Formation Evaluation award from the Gulf Coast North America and Southwest North America regions in 2016 and the SPE Petroleum Engineering Junior Faculty Research Initiation award. She also received the SPE Innovative Teaching Award in 2015. Zoya holds a PhD in petroleum engineering from UT-Austin.

Mark Proett

Mark Proett is the 2017 recipient of the SPE International Formation Evaluation Award. Mark Proett is a senior petroleum engineering consultant for Aramco Services Company, Upstream Group. Prior to joining Aramco four years ago, Proett worked at Halliburton for 33 years, holding various roles in technology including global technical advisor for formation testing and sampling. He is best known for his publications advocating the viability of formation-testing-while-drilling, which was introduced in 2002. He is also known for developing new methods of pressure transient and gradient analysis methods. Mark is also credited for innovations such as the oval probe and focused sampling that improve sample quality while reducing rig time. Proett is a former chair of the SPE Pressure Transient Testing Committee. He has also served on the SPE Reservoir Description and Dynamics Committee and on numerous SPE Advanced Technology Workshops throughout his career. He was recognized as an SPWLA Distinguished Speaker in 2004 and 2014. He was designated an SPE Distinguished Lecturer for 2006–2007 and 2017–2018. In 2008 Mark received the SPWLA Distinguished Technical Achievement Award and in 2013 the SPE Gulf Regional Formation Evaluation Award. Proett holds a BS in mechanical engineering from the University of Maryland and an MS from Johns Hopkins University.

Chris Cade
1960–2018

Chris Cade sadly passed away on the April 3, 2018, at age 57. He died from a metastatic melanoma, which he fought with quiet bravery and with great dignity for some years.

Chris graduated with a Bachelor's degree in Geology from the University of Wales in Aberystwyth, a Master's degree in Sedimentology from the University of Reading and an MBA from the Open University. Upon graduation, he briefly worked with Geochem in Chester as a consultant sedimentologist mainly on UK continental shelf projects. The bulk of his career spanning over 29 years was spent with BP where he served as Director of Petrophysics.

Chris joined BP as a sedimentologist in 1989, and after roles in the BP Research Centre and in frontier business access teams, transitioned into a role as a petrophysicist. As a petrophysicist he worked in BP's UK, Norway and Canada offices, working across the whole value chain from Exploration through Appraisal to Production. His petrophysical 'heart' lay in reservoir description and characterization, but Chris also had significant work experience in Operations and Seismic Rock Properties.

Chris had many leadership roles in the petrophysics discipline: In 2001, while based in Canada, he took on the Petrophysics Network Lead, which he held up to 2003. In 2009 he moved from a role in BP's Azerbaijan business to lead the development of the BP Petrophysics Accelerated Development Program but it was within his role as BP Director of Petrophysics to which he was appointed in 2011 that will be his lasting legacy

Chris was widely known amongst BP's subsurface community for his passion for petrophysics and his commitment to developing capability. He touched and influenced many people during his years with BP. Chris was instrumental in developing the petrophysical learning program and was responsible for the recruitment and nurturing of both recent graduates and established expert petrophysicists. He led the petrophysical community in an inclusive and encouraging way, generous with his time and energy for individuals, always willing to help people. He was thoughtful, deliberate and measured and always with a calm, yet positive and energising manner. Chris continually encouraged people to be the best they could be by creating the environment and challenges for them to develop.

Chris was often seen at Symposia, as either an author or session chairperson but also worked behind the scenes for the SPWLA, serving on the Technical Committee for many years.

Chris was also a motor enthusiast, keen golfer, passionate about music and cricket, and as a true Yorkshire man, a lifelong Leeds United supporter.

Chris is survived by his wife and two children. Chris was the perfect role model, not just as a professional and talented scientist but as a warm and genuine human being and will be fondly remembered and greatly missed by his friends and colleagues but none more than his family whom he had great pride in.

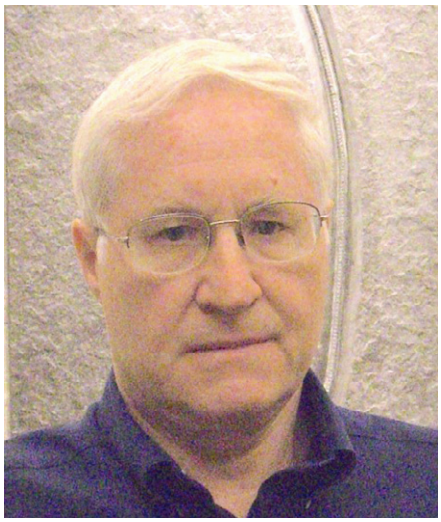
John Williams
Michael Webster

Anyone wishing to make a donation in honor of Chris may send a contribution to the following charities:

http://www.cancertreatment.org.uk/research/melanoma.html

https://www.icr.ac.uk/our-research/centres-and collaborations/the-royal-marsden-partnerships/drug-development-unit

Richard F. Sigal
1943–2017



Richard Sigal had a long career in academics and the oil and gas industry. Richard was born in Cleveland, Ohio, in 1943. He received his BS Degree in Mathematics from Case Institute of Technology in 1965. He continued his education at Belfer Graduate School of Science, Yeshiva University, NYC, receiving a Masters and PhD in Physics in 1967 and 1971, respectively. His doctoral thesis was in general relativity.

Richard joined the faculty at the University of Alberta in Edmonton, Canada, as a research associate in geophysics until joining Amoco Production Co., in 1978, where he worked until 1999. At Amoco, Richard served as a research scientist in geophysics specializing in potential fields such as gravity magnetics, magnetotellurics, and other surface electrical methods. He was instrumental in developing a magnetotelluric workstation.

Richard turned to petrophysics late in his career. His interests changed after his immersion in the Amoco Petrophysical training program (1997) and were redirected towards petrophysics with a special interest in NMR. After leaving Amoco in 1999, he worked as for several years as Petrophysics Group Leader at Halliburton improving resolution of NMR tools and edited the 1999 NMR Logging Principles and Applications book. He spent three years (2001–2004) at Anadarko coordinating gas-hydrate field experiments involving NMR.

In 2004, he joined the University of Oklahoma where he was the Unocal Centennial Professor and shared his NMR expertise with faculty and students alike. He began in earnest to apply NMR to the understanding of unconventional shale resources and gas hydrates. This led to significant contributions rationalizing NMR permeability estimators, understanding shale wettability and the signature of gas in shales. He studied, and tried to improve quantitative blank correction in MICP accounting for mineral compressibility. Richard was stubborn in his pursuit of answers and would often buck management-imposed course corrections when he thought differently. His tenacity, persistence and smile we will sorely miss.

Richard had seven patents covering subject matter from nuclear magnetic resonance and magnetotellurics and authored or co-authored nearly 40 publications on subjects ranging from nuclear magnetic resonance, magnetotellurics, gravity and magnetics, permeability, formation pressure and gas hydrates. He served as SPWLA Distinguished Speaker in 2002–2003 and 2003–2004. Richard's extensive record of community service included initiating the formation of a Saturday morning Physics Program offered to select high school students, chairing a task force to evaluate the Physics curriculum within the Tulsa Public Schools, participating in the Foster Care Program and teaching science enrichment at elementary and middle schools.

In 2011 Richard took semiretirement and moved to Las Vegas. He greatly enjoyed his years of retirement. His widow, Mary Sigal, said that they were both grateful for having the time, inclination, wherewithal, and (until the very end) health to fully enjoy recreation and travel. Richard was keenly aware that he was in a fortunate position and he made the most of it.

Kent Newsham
Carl Sondergeld

ACOUSTICS SIG

General News

The SPWLA Acoustics SIG Board members for 2017/2018 are as follows:

Chairman	Rob Vines (Shell) Robert.Vines@shell.com
Vice Chairman	Doug Patterson (Baker-Hughes, GE), Douglas.Patterson@bakerhughes.com
Secretary	Matt Blyth (Schlumberger) MBlyth@slb.com
Treasurer	Alexei Bolshakov (Chevron) Alexei.Bolshakov@chevron.com
Secretary of Publications	Philip Tracadas (Halliburton) philip.tracadas@halliburton.com

Recent Events

20 February 2018 – The SIG held its first meeting of 2018 at the GE/Baker Hughes CTI in Houston and was also broadcast online for those outside of Houston who wished to attend. Thirty-two people attended in person with eight more online which was a good attendance for this event. The meeting was in two parts: The first half was a series of four acoustics-related presentations on topics ranging from fracture ID, to anisotropy and understanding cementing information using MIE resonances (which was new to the audience); the second half of the meeting was made up of two short workshops to provide discussion points on industry problems. The first workshop was a discussion on what data should be presented and how, when delivering acoustic anisotropy products. The second was a discussion on how to incorporate the recent advances in borehole acoustic reflection imaging into existing workflows and how to use its potential value effectively. Both discussions prompted lively discussion and questioning from the attendees. The meeting was a closed after a review of outstanding SIG business and an outline of the plans for the next meeting.

Upcoming Events

SIG members are currently arranging the next meeting in London, to be held the day after the SPWLA annual convention concludes.

AUSTRALIA CHAPTER
(Formation Evaluation Society of Australia, FESAus)

General News

FESAus, the Australian chapter of SPWLA combines the formation evaluation societies from around Australia predominantly FESQ. Technical meetings are held in Perth on the second Tuesday of each month, with webcasts of the presentations available soon after for members from other states to view. Please visit www.fesaus.org for meeting information.

2018 Committee members

President	Adrian Manescu
Vice President/Assistant Treasurer/Newsletter Coordinator	Wesley Emery
Treasurer/Company Secretary	Callum Rideout
Website Coordinator/Data Standards Focal Point	Martin Storey
Secretary/Inter-Society Liaison/Social Coordinator/Special Events and Awards	Leanne Brennan
Past President	Nariman Nouri
Sponsorship Coordinator	Andrea Paxton
Monthly Meeting Coordinator	Meretta Qleibo
Membership Coordinator	Siobhan Lemmey
New Technology Forum Coordinator	Ben Van Deijl
New Technology Forum Coordinator	AbdelRahman Elkhateeb
Education Group Leader	Matthew Josh
Audio Visual Coordinator	Nigel Deeks
Audio Visual Coordinator	Yang Xingwang
Education Group Team	Paul Pillai
Committee Member	Gerry McGann
Victoria Representative	Matthew Durrant
NSW Representative	Harris Khan
SA Representative	Barbara Stummer Fahad Khan

Recent Events

13 March 2018 – The monthly technical meeting included a presentation by Ruslan Badamshin and Ryan Crawford, "Best in Class Core Analysis on Thin Bed Reservoir Rock." The talk was well received with a great deal of discussion and sharing of ideas.

FESAus March 2018 meeting. Chapter President Adrian Manescu (right) presents Ruslan Badamshin and Ryan Crawford with the speaker's gift.

10 April 2018 – Russell Davies (Structural Geology Advisor, Schlumberger) gave a presentation on "Characterizing Reservoir Compartmentalization: Single Well Fault Seal Analysis and Uncertainty." Russell's talk was well received with a great deal of discussion and sharing of ideas.

26 April 2018 – Ben Van Deijl gave a course on the "Psychology of Decision Making."

FesAus April 2018 meeting. Chapter president Adrian Manescu (left) presents the speaker Russell Davies (right) with the speaker's gift.

Upcoming Events

10 July 2018 – Tim Conroy will give a presentation on "Accelerating and Enhancing Petrophysical Analysis: A Case Study of an Automated System for Well Log Outlier Detection and Construction."

11 September 2018 – New Technology Forum. This year's topic is hardware.

09 October 2018 – Matt Shaw will give a presentation on "Uncertainty in Petrophysical Properties for Reservoir Modelling."

Please visit the Technical Meetings section of the chapter website www.fesaus.org for details on upcoming technical talks.

BANGKOK CHAPTER

General News

The Chapter still is actively seeking speakers several upcoming meetings.

Recent Events

26 April 2018 – Greg Heath (Independent Petrophysicist & Operations Geologist) presented a very interesting talk entitled "The Case for Integrated Petrophysics." The talk highlighted the basic truth that the log data we need are not always available. The talk was of interest to those influential in acquiring the data, as well as the end users of the data.

Bangkok Chapter April 2018 meeting. Greg Heath was the speaker.

Upcoming Events

31 May 2018 – The meeting will be held in the ENCO Complex (Tower C) in Bangkok. The room and topic are not yet finalized with several potential subjects being reviewed.

BOSTON CHAPTER

General News

The Boston Chapter continues with our active events schedule, and SPWLA general and Boston affiliate members are invited to browse our website http://boston.spwla.org to know more about our mission and events.

Recent Events

Our recent talks and networking luncheons were held at the Schlumberger-Doll Research Center, Cambridge, Massachusetts:

30 March 2018 – Aidan Blount (Shell Oil Company) presented his SPWLA Distinguished Lecture titled "Lessons Learned in Permian Core Analysis: Comparison Between Retort, GRI, and Routine Methodologies."

20 April 2018 – Justin Montgomery (MIT, Cambridge Massachusetts) presented a SPWLA-SPE joint-sponsored lecture titled "Spatial Variability of Tight-Oil Well Productivity and the Impact of Technology."

Boston Chapter April 2018 meeting. Officers of the Boston Chapter of the SPWLA present the speaker with a plaque as a token of appreciation. Left to right: Paul Craddock, Ravinath Kausik, Aidan Blount (speaker), Julie Kowan, and Sushil Shetty.

May 4 – Terrence O'Sullivan, Vapor Condensation Technologies LLC, presented a lecture titled "Transient High Gamma Ray: A new Technology for Reservoir Characterization and EOR Process Optimization."

Upcoming Events

Check our chapter website http://boston.spwla.org for up-to-date information of future events.

CALIFORNIA CHAPTER
(San Joaquin Well Logging Society, SJWLS)

General News

The SJWLS continues to hold its monthly lunch-and-learn meetings at the CRC's conference room at 10000 Stockdale on the third Wednesday of the month. Onur Ataman (Vaquero Energy) joined the committee as Secretary.

Recent Events

With the exception of Rad Sobczyk, all the presenters recent meetings have been SPWLA Distinguished Speakers:

20 September 2017 – Fall BBQ and core viewing.

18 October 2017 – Jim Galford (Halliburton), "Geochemical Photoelectric (PE) Logging."

15 November 2017 – Rad Sobczyk (CRC), "Intensive Natural Fracture Study of Elk Hills Monterey Formation to Better Understand Production Varability."

13 December 2017 – Abbie Morgan and Johanna Hoyt (Aera Energy), "Petrophysics and Geology Intertwinned: A Case Study of an Integrated Modelling Workflow."

17 January 2018 – Sushil Shetty (Schlumberger), "Imaging Near-Wellbore Petrophysical Properties by Joint Inversion of Sonic, Resistivity, and Density Logging Data.

21 February 2018 – Artur Posenato Garcia (UT Austin), "Improved Assessment of Hydrocarbon Saturation in Mixed-Wet Rocks With Complex Pore Structure."

21 March 2018 – Aidan Blount (Shell), "Lessons Learned in Permian Core Analysis; Comparison Between Retort, GRI and Routine Methodologies."

18 April 2018 – Michael Sullivan (CVX), "Briggs Color Cubing of Spectral Gamma Ray—A Novel Technique for Easier Stratigraphic Correlation and Rock Typing."

SJWLS 2018 meeting: (Left to right), January, Sushil Shetty (Schlumberger) (left) receives the speaker's gift from Robert Gales; February, Robert Gales (left) presents Artur Posenato Garcia (UT Austin) with the speaker's gift; March, Robert Gales (left) presents Aidan Blount (Shell) with speaker's gift.

Upcoming Events

16 May 2018 – Bryan Bell (Best Core), "Using Drilling Cutting MICP Data to Determining Rock Quality Variations in Tight Sandstones and Porcelanites."

20 June 2018 – Nikita Seleznev (Schlumberger), "Coherent Interpretation of Wideband Electromagnetic Measurements in the MHz to GHz Frequency Range."

CHINA UNIVERSITY OF PETROLEUM (BEIJING) STUDENT CHAPTER

Recent Events

30 March 2018 – The chapter hosted the Spring-Semester Well Logging Seminar at the Qingdao campus of the China University of Petroleum (East China). More than 30 teachers and graduate students in the Well-Logging Department took part in the meeting. Five international exchange students were invited to participate the seminar and gave presentations on advanced well-logging techniques.:

Elizaveta Ovchinnikova – "Well Logging Technology in Russia and Study in Perm University"

Xufei Hu – "Huber Inversion for Logging-While-Drilling Resistivity Measurements in High Angle and Horizontal Wells"

Lili Tian – "Multi-Detector Pulsed-Neutron Logging Technology and its Application"
Qian Chen – "An Imaging Method Utilizing PGNAA Gadolinium Prompt Gamma to Determine Propped Fracture Parameters and its Application"
Jiajia Song – "Fault Zone Evaluation Using Logging Data"
Fei Qiu – "Application of Multiscale Wavelet Transform Data Processing on High-Resolution Density Logging."

CUPB student chapter 2018 Spring seminar. Elizaveta Ovchinnikova gave a good talk.

CUPB student chapter 2018 Spring Seminar. Discussion on the new well-logging methods.

Discussion and communication on the conference will be good for motivating academic innovation and development of well logging. We are looking forward to the Fall-Semester Seminar on Well Logging Technology which will be held in September 2018.

DENVER CHAPTER
(Denver Well Logging Society, DWLS)

General News

Join us for the monthly DWLS meetings, which are held the third Tuesday each month, beginning in September and running through May. Meetings take place in the Mercantile Room at the Wynkoop Brewing Company in downtown Denver, Colorado. The networking social begins around 11:20 AM, lunch is served at 11:45 AM, and the technical presentation starts at 12:00 PM. The cost for the DWLS luncheon is $20 and guests are welcome to attend. Visit the DWLS website at www.dwls.spwla.org to make your luncheon reservations, renew your membership, or join the society.

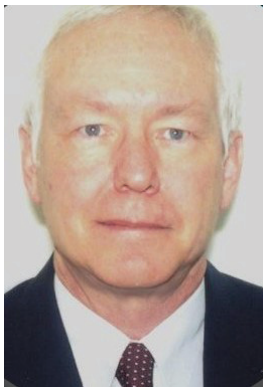
The DWLS is sponsoring scholarship and grant opportunities for graduate students attending a college in the United States Rocky Mountain region, which includes the states of North Dakota, South Dakota, Colorado, Wyoming, Utah, Idaho, Montana, New Mexico, Arizona, and Nevada. Graduate students who are pursuing a degree in a field related to upstream oilfield well log interpretation, specifically petrophysics, geomechanics, geophysics, petroleum, or geology, are encouraged to apply. Application materials and further details are available on the SPWLA website.

Recent Events

20 February 2018 –Dick Merkel (Denver Petrophysics LLC) gave a presentation on methods for calculating variable wettability using resistivity-based saturation models for the Middle Bakken and Three Forks Formations in the Williston Basin. The talk was well attended.

DWLS February 2018 meeting. Dick Merkel (Denver Petrophysics LLC) gave the technical presentation.

20 March 2018 – Bill Donovan (Donovan Brothers Inc.) presented techniques to conduct unconventional reservoir assessments of natural gas markers using mud-logging datasets.



DWLS March 2018 meeting. Bill Donovan (Donovan Brothers Inc.) gave the technical presentation.

17 April 2018 – Steve Cumella (Weatherford) gave the monthly luncheon presentation on the recognition of capillary seals in hydrocarbon accumulations using SP logs. Negative shifts in the SP curve can be used to identify large-scale water movement within the producing reservoir.

DWLS April 2018 meeting. Steve Cumella (Weatherford) gave the technical presentation.

10 April 2018 - The DWLS Spring Workshop was held at Colorado School of Mines. The one-day workshop focused on Core Data in Conventional and Unconventional Reservoirs. The instructors and topics are listed below:

Harry Xie (Core Lab) – "20-MHz NMR Core Analysis Value"

Derek Beckett/Ted Griffin (Core Lab) – "Reservoir Performance in Unconventional Reservoirs, the EOR Requirement"

Aiden Blount (Shell) – "Lessons Learned in Permian Core Analysis: Comparison Between Retort, GRI, and Routine Methodologies"

Mark Sutcliffe (Council Oaks) – "GRI Porosity Issues; Integration of GRI with NMR"

Eric Eslinger (eGAMLS Inc) – "Strategies for Estimating Lithofacies, RQ, and HC in Non-Cored Wells Using Cored Wells"

Ravinath Viswanathan (Schlumberger) – "Fluid Typing With Core NMR"

Don Hall (Schlumberger) – "Automated Cuttings Analysis for Risk Evaluation and Reservoir Characterization"

Rich Rosen (RL Rosen Consulting) – "Impact of Experimental Studies on Unconventional Reservoir Mechanisms"

Claudia Amorocho (Weatherford) – "Moving from Qualitative to Quantitative Geomechanical Models"

Neil Fishman (PetroLogic Solutions, LLC) – "Part 1: Results From a Comparative Study of Core Analysis Procedures in Unconventional Tight Oil Rocks"

Gary Simpson (Consultant) – "Part 2: Results from a Comparative Study of Nuclear Magnetic Resonance (NMR) Core Analysis Measurements in Unconventional Tight Oil Rocks"

Michael Hoffman (AIM GeoAnalytics) – "Visualization and Quantification of 3D Pore Networks Using Confocal Laser Scanning Microscopy (CLSM)."

Upcoming Events

15 May 2018 – Mike Miller (Cimerex) will give the technical presentation.

Visit the DWLS website at https://dwls.spwla.org to make your reservations.

FORMATION TESTING SIG

Recent Events

07 March 2018 – The annual meeting of the Formation Testing SIG was held at Repsol's office in The Woodlands, Texas, and was attended by 85 people. Eleven invited speakers from industry and academia showcased the latest development and application in formation-testing technology. The afternoon session was dedicated to topics related to unconventional reservoirs.

FT SIG 2018 annual meeting. Presenters (left to right): Deepak Devegowda (University of Oklahoma), Thomas Blasingame (Texas A&M University), Mayank Malik (Chevron), Li Chen (Schlumberger), Wilson Pineda (BP), Femi Adegbola (BHGE), Don Westacott (Halliburton), Oliver Mullins (Schlumberger), Amie Hows (Shell), and Yucel Akkutlu (Texas A&M University). Neil Stegent (Halliburton) is missing from the picture.

FRANCE CHAPTER
(formerly Société pour l'Avancement et l'Interprétation des Diagraphies, SAID)

General News

SAID received the new SPWLA charter by end 2017. After a first in-depth review by the board in January 2018, SAID decided to submit to a vote the new charter to the 41 current SAID members. The vote took place between 18 March and 18 April; the quorum was reached with the first ballot and the charter was accepted with a high score. SAID also took this opportunity to change name to conform to the new charter. From now on, the "Société pour l'Avancement et l'Interprétation des Diagraphies" will be known as SPWLA France Chapter. A new page is turned!

Recent Events

05 April 2018 –The first technical workshop of 2018 was held in Paris. The chapter offered our community of well-log analysts and petrophysicists a refreshing subject, "Borehole Seismic," that impacts geology, geophysics and well evaluation. The session was planned in two distinct parts: the first focused on VSP technologies and second part on interpretation techniques and case studies. A general introduction for nonspecialists was also given as introduction. The workshop was very well attended and followed in parallel, via Skype, by a large community of geologists and geophysicists going from VSP manufacturers, service providers and surface seismic companies to operators. Debates were fruitful and focused on the new technological trends for VSP (use of optical fiber, drill bit as downhole VSP source, azimuthal orientation of VSP signal etc.) as well as needs and interactions between geologists, geophysicists, reservoir engineers and drillers. The workshop included the following presentations:

Jean-Claude Puech (Schlumberger) – Introduction, "Basics on Borehole Seismic"

Avalon Geosciences, Gary Tubridy and William Wills, presented by Charles Naville (IFP-EN) – "What's Needed, What's New and What's Next?"

Oleg Valishin (SERCEL) – "New Acquisition Technologies for VSP and Microseismic with Conventional Hardware And Fiber Optical Distributed Acoustic Sensing (DAS)"

Michel Verliac (TOTAL) – "Borehole Seismic Applications From Operator's Perspective"

Sylvain Serbutoviez (IFP-EN) – "Log of Formation Parameters While Drilling"

Charles Naville (IFP-EN) – "Orientation of 3-Component Rig-Source VSP."

France Chapter April 2018 workshop. (Left to right) Jean-Claude Peuch (Schlumberger), Charles Naville (IFP-EN), and Oleg Valishin (SERCEL).

France Chapter April 2018 workshop. (Left to right) Michel Verliac (TOTAL), Sylvain Serbutoviez (IFP-EN), and Charles Naville (IFP-EN).

HOUSTON CHAPTER

General News

SPWLA Houston Chapter Board elections will be held in May.

Recent Events

22 March 2018 Northside – Jennifer Market (Weatherford Acoustics Advisor) presented on "Understanding Sonic Data In Unconventional Reservoirs." The presentation began with a review of sonic measurements in unconventional reservoirs, paying particular attention to concepts such as the depth of detection of nearby beds and distinguishing shale anisotropy from fracture or stress-induced anisotropy. A discussion of wireline and azimuthal LWD data acquisition methods followed with details about optimizing data acquisition in unconventional reservoirs. Then, a workflow was described, with the goal of correctly determining the compressional and shear velocities for the bed in which the tool resides as well as the nearby beds. A discussion of the applications of sonic data in unconventional reservoirs was illustrated with field examples describing (1) the correct methods for interpretation and the common pitfall where incorrectly interpreted results can adversely impact the

petrophysical analysis and production optimization studies.

Houston Northside March 2018 meeting. Jennifer Market (Weatherford) describing sonic anisotropy.

28 March 2018 Downtown (Uptown) – Ali Tinni (Post-Doctoral fellow at The University of Oklahoma) gave his SPWLA Distinguished Speaker presentation titled, "New Perspectives on the Effects of Gas Adsorption on Storage and Production of Natural Gas from Shale Formations." Storage and production of natural gas from shale formations are significantly influenced by the presence of an adsorbed phase on the pore walls. The effects of adsorption on storage and production of natural gas are currently quantified through the establishment of an absolute adsorption isotherm, which is fitted to a Langmuir isotherm. In order to understand the effects of adsorption on the storage and production of natural gas from shale formations, we have measured the total methane storage capacity of core plugs from the Barnett and Eagle Ford shale formations.

Houston Chapter March 2018 Downtown meeting. Ali Tinni (OU) speaking on the effects of gas adsorption.

LONDON CHAPTER
(London Petrophysical Society, LPS)

General News

The London Petrophysical Society will be hosting the SWPLA 59th Annual Logging Symposium in London between 2–6 June at "Old Billingsgate", 1 Old Billingsgate Walk, Lower Thames Street, London. The preparation activities of the organizing committee and the Board are drawing to a head as the event nears. The symposium will include eight short courses, two field trips and three days of spouse activities complement some 120 technical presentations and e-posters together with 30+ booths in the Technical Exhibition where the latest advances in technology will be on display. Also, an Acoustics SIG one-day meeting has been scheduled in London for the day immediately following the Symposium. Details are available through the SPWLA website. Registration for both events is open through the SPWLA website www.SPWLA.org.

The 2018 Committee comprises the following volunteers:

President	Mike Millar (Independent)
Treasurer	Ian Draper (Baker-Hughes (GE)
Secretary	Barry Setterfield (Independent,)
VP Technology	Dawn Houliston (ERC Equipoise Ltd)
VP Seminars	Joanne Tudge (Weatherford)
VP Membership	Sharan Dhami (Independent)
VP Publications	Anne Denoyer (Independent)
VP Arrangements	Ben Fletcher (Independent)
VP Newsletter	Jenny Rastogi (Schlumberger)
VP External Liaison	Brian Moss (Independent)
Officer Sponsorship	Shyam Ramaswami (Shell)
Past President	Iain Whyte (Tullow Oil)

Recent Events

06 February 2018 – Holger Thern (Baker-Hughes, GE) gave his SPWLA Distinguished Speaker presentation titled, "Integrated Gas and Oil Zone Evaluation using NMR, Conventional, and Mud-Gas Logging Data—A Norwegian Logging-While-Drilling Case History" on the topic of combining mud-log data with NMR data.

22 February 2018 – A one-day seminar in our series on "Back to Basics" workshops. This series is highly appreciated by the younger generation and students and also by members of other disciplines who get involved in petrophysical analyses and need a refresher. The offering this month comprised a day's worth of erudite workshop-style presentations on some of the basic concepts of interpretation in the discipline.

06 March 2018 – John Bennett (Bennett Petrophysics Ltd.) gave a presentationon the topic of "Who Wants to be a

petrophysicist? The Net:Gross Quiz." We are especially grateful to John for stepping up literally at the last minute when our scheduled speaker was suddenly indisposed and couldn't give his lecture. Thank you, John!

17 April 2018 – A dual presentation was held at this evening meeting:

Dr. Erwan Le Ber **(**Leicester University) – "High Impact Drilling: Chicxulub, Petrophysics And Cluster Analysis," and

Kieran Blacker (Leicester University) – "Linking In-Situ Geotechnical and Physical Properties to Geophysical Surveys: A Case Study for a Proposed Windfarm a*t* Dogger Bank."

The LPS and its membership is extremely grateful to all the speakers who gave of their time and effort to prepare excellent presentations for these occasions, and to the stalwart volunteers behind the scenes who organise the activities.

As a registered UK charity, we rely on volunteers and industry donations to maintain our operations and fulfill our objective to disseminate scientific and technological information and education about all things related to formation evaluation to the interested public. As an organizing committee, we are ever grateful to our supporters, financial and technical, and for our members who attend events and take benefit from them. Without you all we could not operate.

Upcoming Events:

The following evening lectures will be held at The Geological Society of London, Piccadilly, London, starting at 18:30:

15 May 2018 – Dr. Catriona Reynolds (Wood Mackenzie) and Dr. Hannah Menke (Imperial College, London) will offer dual presentations under the single title "4D Multiscale Imaging of Steady-State Two-Phase Flow in Sandstones and Reactive Flow in Carbonates."

June 2018 – There will be no June meeting due to hosting the SPWLA Annual Logging Symposium.

03 July 2018 – Speaker and topic TBA

August 2018 – Summer break.

04 September 2018 – Dr. Steve Cuddy (Baker-Hughes, GE) will speak on "Using Fractals to Determine a Reservoir's Hydrocarbon Distribution."

27 September – A one-day seminar on "Seismic Rock Physics" will be held 0900 to 1800 at our regular venue.

23 October 2018 – Shanawaz Kahn (Schlumberger) will speak on "Application of Dual Physics LWD – High-Resolution Imaging Tool in OBM."

November 2018 – AGM accompanied by a presentation of general interest outside mainstream petrophysics.

13 December 2018 – A one-day seminar on the topic of "Resistivity-Free Saturation" will precede the President's evening (our wine and savouries Christmas social function.)

MALAYSIA CHAPTER
(Formation Evaluation Society of Malaysia, FESM)

General News

FESM, a local chapter of Formation Evaluation Society of Malaysia is based in Kuala Lumpur. Technical meetings are held on fourth week of each month. For meeting information, please visit our chapter website at www.fesmkl.com. On behalf of FESM, we would like to extend our sincere gratitude for all the hard work and dedication by Jassica Jee. Jassica stepped down as treasurer of FESM and this is succeed by Samie Lee. Welcome on board, Samie !!!

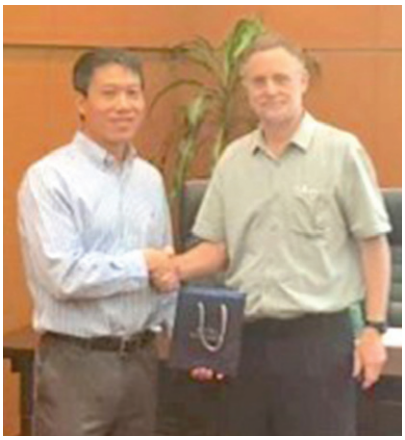
Recent Events

08 March 2018 – Zarool Hassan (Vestigo Petroleum) delivered a talk entitled "Rock Classification in Saturation Height Function for Dummies." He explained different methods to classify reservoir rocks and how to transform to predict fluid flow behavior. His example was based on hydraulic flow units to create a generic template for building a saturation-height model.

FESM March 2018 meeting. Zarool Hassan (Vestigo) (right) receives token appreciation from Grant Heavysege.

29 March 2018 – FESM hosted Chunming Xu (Shell Brunei) who delivered his talk on "A Boomerang Workflow for Geological and Petrophysical Characterization of the Shaly Heterolithic Reservoirs in Offshore Brunei." He presented sequential and integrated analysis in the Boomerang method based on the observation of the log response from crossplots, layouts etc. The interpretation will calibrate with core data and image log. Xu also

explained the impact of sedimentary processes and fluid type on boomerang characters.



Malaysia Chapter March 2018 meeting. (Left) Chunming Xu (Shell Brunei) receives a token of appreciation from Grant Heavysege.

NEW ORLEANS CHAPTER

Recent Events

January 2018 – SPWLA Distinguished Speaker Artur Posenato Garcia (UT Austin) gave a talk entitled "Improved Assessment of Hydrocarbon Saturation in Mixed-Wet Rocks with Complex Pore Structure."

New Orleans Chapter January 2108 meeting. Chapter President Vincent Liaw (left) presents speaker Artur Posenato Garcia UT Austin) (right) with a fleur-de-lis travel mug as a token of appreciation for his presentation.

February 2018 – SPWLA Distinguished Speaker Holger Thern's (Baker Hughes, GE) presentation was entitled "Integrated Gas and Oil Zone Evaluation using NMR, Density, and Mud Gas Data—A Norwegian Logging While Drilling Case History."

New Orleans Chapter February 2018 meeting. Chapter President Vincent Liaw (left) presents speaker Holger Thern (BHGE) (right) with a fleur-de-lis travel mug as a token of appreciation for his presentation.

20 March 2018 – Zhipeng "Z" Liu visited the chapter. We had a meet-and-greet session with him as he updated us on the recent SPWLA development and SPWLA Symposium in London. He also presented a technical paper titled "Measuring Remaining Oil Saturation with Cased-Hole Pulsed-Neutron Log in CO_2 EOR Fields."

New Orleans Chapter March 2018 meeting. SPWLA President Elect Zhipeng "Z" Liu (Kinder Morgan) updates the chapter on recent SPWLA developments.

17 April 2018 – SPWLA Distinguished Speaker Gordon Moake presented his paper "Characterizing Natural-Gamma-Ray Tools without the API Calibration Formation."

All meetings were well attended.

OMAN CHAPTER

General News

SPWLA Oman would like to introduce the list of the Board Directors for 2017–2018.

President	Rifaat Al-Mjeni (PDO)
Vice President	Sultan Shoaibi (PDO)
Secretary	Sultan Balushi (PDO)
Event Organizer	Qais Battashi (PDO)
Membership Coordinator	Mohammed Farooq (PDO)
Treasurer	Yousuf Azri (MOG)
IT Coordinator	Jalal Shukaili (OXY)

Recent Events

29 January 2018 – Maria Boya Ferrero (PDO) gave a presentation titled "Targeting Secondary Oil Rims GOGD in a Mature 50-Year Old Development in the Sultanate of Oman," Paper SPE-188788. Gas oil gravity drainage is of particular interest for fractured reservoirs where injection is troublesome; it is an effective method to increase ultimate recovery but it is a slow process. After 50 years into the development of a giant oil field in Oman, a new strategy for placement of additional GOGD wells is proposed, with the objective to optimize the performance of specific layers. There was a good attendance from PDO petrophysicists and from other operating and service companies in Oman.

Oman Chapter 20 January 2018. (Left) Maria Boya Ferrero (PDO) gave the presentation, (right) the speaker with the chapter committee.

UNIVERSIDADE FEDERAL DO RIO DE JANEIRO (UFRJ) Student Chapter

General News

The UFRJ SPWLA Student Chapter is proud to announce our new board. This new energetic and resourceful team is committed to consolidate the work done by the previous boards, bridging the gap between the industry and the university. The new board is:

President	Fernanda Senra
Vice President	Lucas Batista
Secretary	Anna Peres
Treasurer	Gabriela Lopes

Recent Events

14 November 2017 – Attended the 154th monthly meeting of SPWLA Brazil Section.

19 December 2017 – Attended the 155th monthly meeting of SPWLA Brazil Section.

08 March 2018 – SPWLA Introductory Lecture during the 2018 Freshmen Welcome Day.

17 March 2018 – Election of 2018 board.

20 March 2018 – Attended the 156th monthly meeting of the SPWLA Brazil Section.

UNIVERSITY OF HOUSTON STUDENT CHAPTER

General News

Chapter governing board members:

President	Naveen Krishnaraj
Vice President	Sabyasachi Prakash
Secretary	Huy Tran
Treasurer	Katherine Ramirez
Event Manager	Charles Adams
Webmaster	Utkarsh Sinha

U of H Chapter Board members and volunteers.

Recent Events

16 February 2018 – Aidan Blount (Shell) gave his SPWLA Distinguished Speaker talk titled "Lessons Learned in Permian Core Analysis: Comparison between Retort, GRI, and Routine Methodologies." His paper explains a robust comparison study between two vendors analyzing the core sample preparation, analytical technique for measuring water saturations etc., assumptions made, and the results. The Lecture was an eye opener for young, well-logging aspirants and thus enjoyed a robust attendance from the Undergraduate, Graduate and PhD Levels.

U of H February 2018 meeting. SPWLA Distinguished Speaker Aidan Blount (Shell) (right) receiving chapter gift for his presentation.

24 March 2018 – The chapter conducted a student paper contest at the Graduate and PhD levels. Dr. Kyung Jae Lee and Dr. Farouq Ali served as judges for Graduate level abstracts and Dr. Ron Bonnie and Mr. Fred Jenson served as judges for PhD level abstracts. This event saw healthy participation and five and eight abstracts chosen at the Graduate and PhD levels, respectively. Each participant presented for 20 minutes and all displayed the utmost professionalism while doing so. The results are as follows:

Rank	PhD Level	Graduate Level
1st place	Mohab Dessouki	Jude Rodrigues
2nd place	Naveen Krishnaraj	Enjelia Veony
3rd place	Sabyasachi Prakash	Dutt Tripathi

U of H. Student Paper Competition March 2018. Contest participants, judges, and volunteers.

THE UNIVERSITY OF TEXAS AT AUSTIN STUDENT CHAPTER

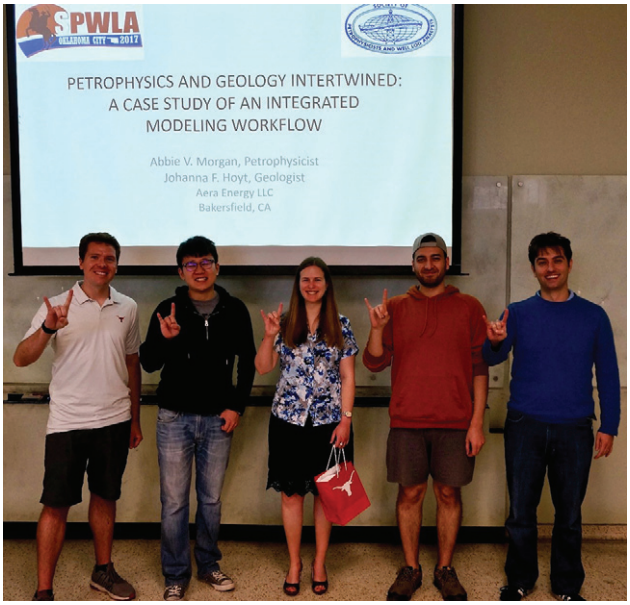
General News

The spring semester is rapidly coming to a close in Austin and the Student Chapter of SPWLA at UT-Austin has been busy participating in volunteering events, hosting technical lectures, and holding our annual internal student paper contest. These events have been very successful and we look forward to continuing these traditions in the future. We are excited to nominate three members to represent the chapter at the 2018 SPWLA International Student Paper Contest in London.

Recent Events

03 March 2018 – Chapter members volunteered at "Explore UT" at The University of Texas at Austin. The event brought over 50,000 visitors (K-12 students, teachers, and parents) to campus to participate in hands-on demonstrations, experiments, and other activities geared towards encouraging students to pursue higher education. Our chapter, in collaboration with the Petroleum Graduate Student Association, hosted an event called "Jell-O Fracking" for over 500 participants. During the hands-on activity, students learned about geological and engineering concepts related to hydraulic fracturing. The event was a huge success and we received very positive feedback from parents and educators regarding our method of explaining such complex topics.

09 March 2018 – The chapter hosted SPWLA Distinguished Speaker Abbie Morgan (Aera Energy) for a technical seminar entitled "Petrophysics and Geology Intertwined: A Case Study of an Integrated Modeling Workflow." The talk was very well attended and we sincerely thank Abbie for sharing her unique perspective and interesting work.



UTA Student Chapter March 2018 meeting. Chapter with SPWLA Distinguished Speaker Abbie Morgan. Pictured from left to right: Colin Schroeder (President), Tianqi Deng (Webmaster), Abbie Morgan (Speaker), Mohammed Al-obaidi (Public Relations), and Artur Posenato (Secretary).

30 March 2018 – The chapter held our annual internal student paper contest and nominated three members to represent UT-Austin at the 2018 SPWLA International Student Paper Contest in London. Our chapter's nominees include Michael Wang (Undergraduate Division), Nicholas Staviski (Undergraduate Division), and RunQi Han (PhD Division). The nominees gave excellent presentations and the event was very well attended. We would like to thank all of our presenters as well as our judges Dr. Hugh Daigle, Dr. David Medellin, Dr. Mahdi Haddad, and Dr. Bruce Klappauf.

Upcoming Events

As the school year closes, the chapter is finalizing plans for officer elections for the 2018–2019 school year. We are looking forward to welcoming our new officers to the leadership team.

Petrophysical Data-Driven Analytics: Theory and Applications
SPWLA 2018 Spring Topical Conference, 16–17 April, Houston, Texas, USA

The 2018 SPWLA Spring Topical Conference was successfully held on 16–17 April in Houston with a focused topic on petrophysical data-driven analytics (PDDA). Dr. John Doveton from Kansas Geological Survey, one of the pioneers in computer- and machine-aided geological-petrophysical interpretation, delivered a keynote speech on the history review of PDDA applications. Twenty-four technical talks in six subdisciplines were delivered (Fig. 1) with a very well-balanced distribution among academia, service companies, and operators (Figs. 2 and 3). Dr. Chicheng Xu (Aramco) and Dr. Siddharth Misra (University of Oklahoma) led technical panel discussions that were very productive and generated many insights regarding advancements, challenges, and opportunities in the area of PDDA. STC had a full-house attendance (60+) with a few international travelers from Australia, Saudi Arabia, and China (Fig. 4). People showed great interest and SPWLA is going to launch a new Special Interest Group (SIG-PDDA). More than 40 guests have already signed and preregistered for the SIG-PDDA. An official announcement will be made after SPWLA board approval. Please follow SPWLA for SIG-PDDA registration.

SPWLA 2018 Spring Topical Conference Program
April 16–17, Frank S Millard Training Center, Houston, Texas

Day	Start	Speaker/Host	Affiliation	Title
Monday, April 16	8:00 AM	Chicheng Xu (Chair)	Aramco Services Company	Welcome/Introduction
Keynote Speech	8:20 AM	John Doveton	Kansas Geological Survey	Think Deep: Some history on digital knowledge strategies in petrophysics and subsurface geology
Geological-Petrophysical Interpretation (Session I)	8:50 AM	Dawn Jobe	Aramco Services Company	Prediction of Geological and Petrophysical Features Using Image Based Machine Learning
	9:20 AM	Irina Emelyanova	CSIRO Energy	Hierarchical spectral clustering of well logs for characterization of continental sandstones
	9:50 AM	Ting Li	Schlumberger	Facies Classification Using Self-Organizing Maps Improves Permeability Estimation in a Heterogeneous Middle East Carbonate Field
	10:20 AM	**Coffee Break**		
Geological-Petrophysical Interpretation (Session II)	10:50 AM	Don Westacott	Halliburton	Modern Data Analytics Techniques applied to Unconventional Reservoir Exploration and Development
	11:20 AM	Wei Shao	Halliburton	A "Smart Data" Machine Learning Approach for Developing Petrophysical Interpretation Model
	11:50 AM	Bo Zhang	Alabama University	Deep Machine Learning in Assisting Well Correlation Analysis
	12:20 PM	**Lunch Break**		
Logging Technology	1:00 PM	Yankai Xu	Schlumberger	Borehole Resistivity Measurements Modeling by Using Machine Learning Techniques
	1:30 PM	Qiuyang Shen	University of Houston/Chevron	Interpretation of Ultra-Deep Azimuthal Propagation Resistivity Measurements Stochastic Inversion, Data Analytics, and Uncertainty Quantification
	2:00 PM	**Coffee Break**		
	2:30 PM	Guangzhi Liao	China University of Petroleum, Beijing	Real-time Multidimensional NMR data inversion with compressed sensing method
	3:00 PM	Han Jiang	University of Texas at Austin	A study of clustering algorithms for fluid partitioning of NMR T1-T2 data in shales application to characterize fluid evolution under thermal effects
	3:30 PM	Siddharth Misra	University of Oklahoma	Shallow vs. Deep Neural Network Models for Generating the In-Situ NMR T2 Distributions
				Comparative Study of Shallow Learning Methods for Sonic Log Generation
	4:15 PM	**Panel Discussions**		
Tuesday April 17				
	8:00 AM	Irina Borovskaya (Vice Chair)	SPWLA Houston	Introduction
Engineering Applications	8:20 AM	Dingding Chen	Halliburton	Optical Tool Database Reconstruction with Validated Mapping from Fields and Additional Oil and Gas Information Source
	8:50 AM	Wei Yang	Xi'an Shiyou University, China	Data-Driven thermal flooding modeling, history matching, prediction, and optimization
	9:20 AM	Cheng xi	Xi'an Shiyou University, China	Reservoir monitoring based on big data and machine learning with Comprehensive Through Casing Resistivity logging: A case in Ordos basin, China
	9:50 AM	**Coffee Break**		
Rock Physics/Geomechanics	10:20 AM	Deepak Devegowda	University of Oklahoma	Use of Data Analytics to Optimize Hydraulic Fracture Locations Along Borehole
	10:50 AM	Ragheb Hanna	Core Laboratories	Water Saturation-Permittivity Data Analytics For Dielectric Log Calibration
	11:20 AM	Carlos Alberto	Repsol Technology Center	Rock Typing and cost-time effective Petrophysical properties prediction in carbonates using multi-energy X-Ray attenuation statistics
	11:50 AM	**Lunch Break**		
Operation Practice	1:00 PM	Bin Dai	Halliburton	A Machine Learning Method for Predicting Optimal Formation Pressure Testing Locations
	1:30 PM	Vladislav Torlov	Saudi Aramco	Data-Driven Assessment of Rotary Sidewall Performance: KPI's, Recovery Trends and Qualification
	2:00 PM	Miguel Angel Munoz Salinas	Schlumberger	Method of creating and visualizing the execution plan for reservoir sampling and pressure operations using petrophysical and operational data-driven analytics
	2:30 PM	**Coffee Break**		
Data QC/Management	3:00 PM	Michael Ashby	Anardarko	Petrophysics-Driven Well Log Quality Control Using Machine Learning
	3:30 PM	Lin Liang	Schlumberger	Machine Learning Based Automatic Well Log Depth Matching
	4:00 PM	Ron Clymer	Devon Energy Corporation	Advancing Subsurface Data Management For The Enterprise
	4:30 PM	**Panel Discussions**		

Fig. 1–Twenty-four technical talks in six subdisciplines were delivered.

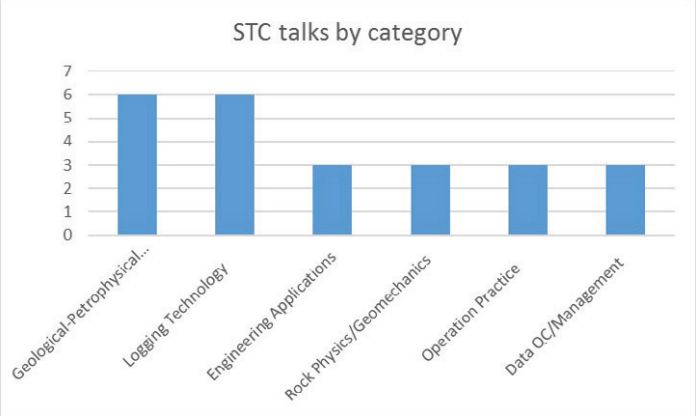


Fig. 2–Talks by Category

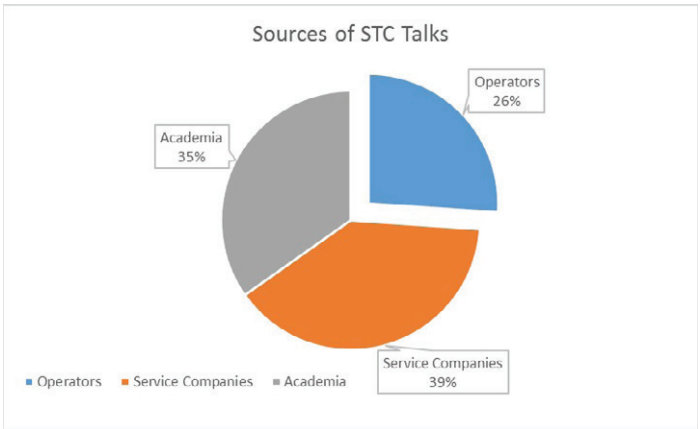


Fig. 3–Affiliation of speakers

Fig. 4–Group photo of 2018 STC attendees

SPWLA Young Professionals Newsletter

the bridge

May 2018

In this edition:

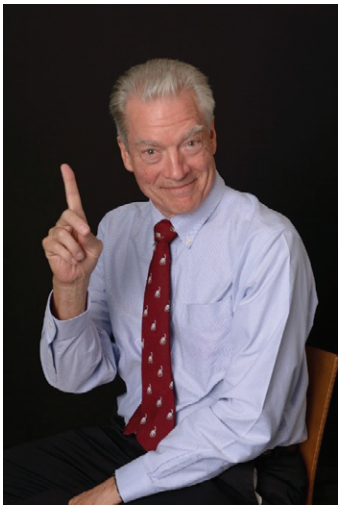
Reflections of More Than Three Decades in the Oil Industry
By Oliver Mullins

Our Data Mangement Journey
By Abbie Morgan

Coffee Break
By Abbie Morgan

SPWLA Networking Happy Hour

A Path from High School to the US National Academy of Engineering: Reflections from Oliver Mullins After More Than Three Decades In The Oil Industry



The index finger reinforces strong statements.

After 31 years in the industry and some time in Universities prior to that, I have reached the age where people are a bit incredulous that I am still working (or perhaps that I am still around). A request for reflections was made possibly to better understand this enigmatic circumstance. So, I proffer reflections of my many years in the oil industry, perhaps there is some utility for younger generations. My first job in the industry was in high school with tasks of cleaning and painting stock tanks and digging ditches to find buried pipes (my coworkers debated the desirability of witching the pipes). I have always loved the oil industry; for me, it combines treasure hunting with chemical and earth sciences probing geologic timelines. What could be better?

In my University days, I obtained a BS in biology, MS and PhD in (nuclear) chemistry, and did post-docs in chemistry and physics departments doing thermodynamics, and laser studies in atomic and molecular physics. Such scientific migrations are sometimes not well suited to a career in academia, but are well suited to industry. I had been looking for permanent work, and while in University of Virginia in 1985, I remember reading in the Washington Post, that Saudi Arabia had just doubled oil production to reclaim market share. About when oil reached $9/bbl, Schlumberger called. I was so sure I would not get that job that I suppose I had an air of nonchalance that SLB found irresistible. Anyway, the offer came in, I took it on the spot, and have yet to relinquish this job.

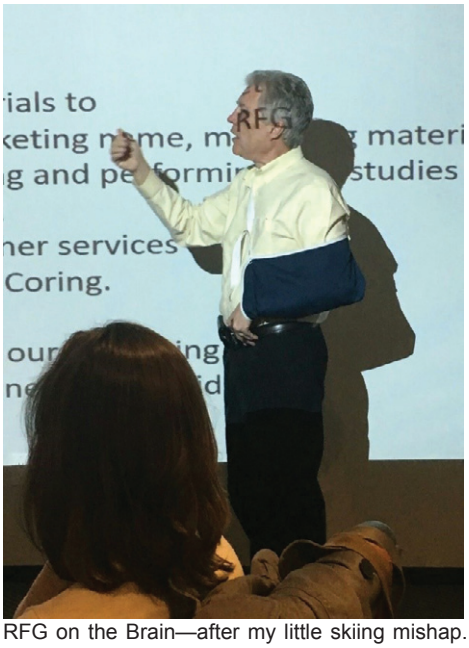
Both my parents were University Professors and all my brothers have advanced degrees. My father was a famous thermodynamicist. I watched how his colleagues paid homage in the naming of the Mullins-Sekerka Instability, and Mullins Thermal Grooving, and we celebrated when he was elected to the US National Academy of Science. I had no idea how all of these things could possibly happen. Still, my father told me he never thought of what he did as a career, he did what he loved doing. I had similar motivations, and I just wanted to play my part in the development of science and of technology.

When I started at SLB research, I wanted to keep my employer happy by developing tools for the oilfield. I learned how gratifying this could be, even though quite different than my University pursuits. Downhole fluid analysis became my mission, which took me around the world interacting with so many enjoyable people and cultures. Nevertheless, I do remember puzzlement of potential clients: “Why would we need to measure GOR downhole, we are going to get a PVT lab report with more numbers in it than the New York City phone book?” I had a trick to get GOR in the field; all wanted clean samples, and GOR could be help sate this objective. I had developed a contamination algorithm which Engineering called OCM. This acronym stood for Oil-based-mud contamination monitoring, not Oliver C. Mullins, but I did my best to confuse this issue, even getting shirts monogrammed with OCM. We found a fluid-density inversion in a “connected sand” in the second and third field tests ever of the GOR-measuring Live Fluid Analyzer (LFA) so I knew we were getting important reservoir information. This started my quest—I needed to understand reservoirs, and this would take a long time.

I also wanted to push frontiers in chemistry. At the time, asphaltene science was in disarray, so I concluded that this arena was my best chance to leave my mark. My most cited work, the first asphaltene molecular diffusion measurements, led to the resolution of asphaltene molecular weight and architecture. I knew if I

Call for anecdotes and photos:

It’s time for a change! Instead of always having a long article, we decided to shift gears and call for photos and short anecdotes. For outsiders, the oil and gas industry calls to mind images of big machines, stinky work environments and coveralls stained with grease and crude oil, but we know that is not our true face. We all have fun and exciting moments, memories that make us smile. Why not share them with colleagues?
Send your stories and photos to spwlayp@spwla.org.

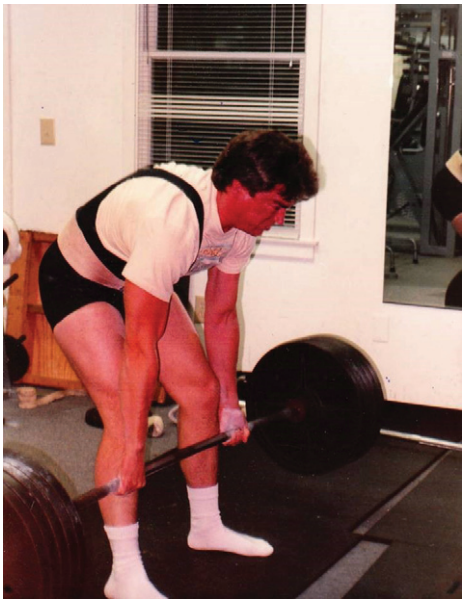


RFG on the Brain—after my little skiing mishap. Nothing will deter me.

made a big deal of these results, that two things would happen: (1) I would be highly cited, and (2) I would have enemies for life. Both predictions came true. Over time, we addressed the most fundamental debates in the field, often obtaining the unexpected, almost all of which have been confirmed. Asphaltenes have been my calling card to work with many leading laboratories around the world; it is pure joy for me to visit yet another research institution to participate in chemical studies of asphaltenes. While it was not our intent, this work allowed us to develop a simple thermodynamic model of asphaltenes, the Flory-Huggins-Zuo Equation of State (FHZ EoS). This theory fits perfectly with Downhole Fluid Analysis (DFA)-measured asphaltenes gradients and is the first and only theory to be employed routinely for asphaltene gradients in reservoirs.

Utilizing DFA, now with the FHZ EoS, we can recognize equilibrated oil columns. Generally, equilibrium of reservoir fluids implies reservoir connectivity. Disequilibrium allows identification of fluid processes occurring in geologic time, we call this a new discipline "reservoir fluid geodynamics" or RFG. RFG accounts for diffusion, convection, and phase change of reservoir fluids post charge. Elements of RFG are in the geochemistry literature such as biodegradation and water washing, but from my point of view, RFG is enabled by thermodynamics, DFA measurements, and the roughly 40 oilfield studies that have delineated many RFG processes. Geologists account for the depositional setting *and* the geodynamics of rock structures post deposition. Petroleum system modeling accounts for the 'deposition' of the fluids, RFG accounts for their processes post charge over geologic time. I greatly enjoy these reservoir analyses; uncovering complexities that Mother Nature has prepared is never-ending fun.

From a broad perspective, I have tried to achieve in three general areas; asphaltenes, DFA and RFG. The first two, and my role in them, is solidified sufficiently for me. The third is in progress, so we will see if this is successful. Each endeavor takes a decade or so, and RFG is a few years in, so I do not worry. I love the process and I will do everything I can to make it succeed, but only time will tell. (I do not believe I have time for a fourth decade-long objective!) I must acknowledge my family in this long process. They have heard more about asphaltenes, wireline logging, and reservoirs than I would care to admit. My son called our three books on asphaltenes, "the trilogy"; at least proving they found some humor in my pursuits.


At a younger age – deadlifting 495 lbs.

I have found commonality in trying to achieve different, bigger objectives. First, I have been a dreamer, trying to create a new big picture. Nevertheless, each dream is built on a mountain of results, carefully obtained and analyzed. I have been very lucky, but some of this luck was prepared. Second, everything of importance I have done has faced substantial, longstanding, at times, fierce criticism. Leadership is not for the faint of heart. Even when an institution benefits from success, I have witnessed some individuals from within and happy with the status quo, who have fought against improvement to the bitter end. Third, I have tried hard to leave my ego out of the picture (this may be hard for some to believe!). I have tried to bring into my fold and learn from all manners of contributors, from world leaders in various disciplines to fresh-outs. I have poached innumerable underappreciated scientists and engineers. I can only provide a vision, a spirit of collaboration and enjoyment, and wonder at the workings of Mother Nature. But/and I have vigorously and openly fought those who would improperly impeded our effort and our people.

The SPWLA has been very important to me. The SPWLA has always provided a forum for new ideas and represents something of an oasis for competitors to share experiences and knowledge in almost a family setting. The SPWLA also acknowledged my contributions with awards, the Technical Achievement Award and later, the Gold Medal, which were very important in my career. I have been fortunate to have received other acknowledgements. Our asphaltene work led to what is now called the Yen-Mullins model. This work was cited by the American Chemical Society in awarding me the 2018 George A. Olah Award in Hydrocarbon or Petroleum Chemistry. And most recently, I have been elected into the US National Academy of Engineering. I greatly appreciate these distinctions as I know my parents would, and I know my father would understand how all these things happened. I believe I represent communities of contributors who have worked tirelessly and I do hope my successes are viewed as our shared successes. I look forward to continuing along my path with so much support; we will see what great things we can accomplish.

Our Data Management Journey

Abbie AV Morgan

In my day-to-day petrophysical work, I find that I spend a lot of time looking for data and manipulating data before I finally get to the real analysis. I might have to look through hard copy files, digital network folders, and various databases. Some databases may store documents but not digital data, while others may store certain types of digital data but not others (array data seem to be particularly difficult to store properly). Some data may require digitizing before being usable, and some may require transfer between various databases or programs, often creating a need for further manipulation on the receiving end. After doing the same manipulation multiple times, I have seen opportunities to write scripts to automate some of these steps. I am slowly building up a collection of scripts that perform different operations that will make my workflow more efficient little by little.

In our data management journey as petrophysicists, there are many questions to ask. How do we store and track documents and digital files, and how can we tell if a file is considered the "final" file? How can we track who has done what to an edited curve or who has used what model to calculate a saturation, and can we avoid rework by tracking these things? How can we be confident in the completeness of our data for a certain well? How can we avoid or efficiently identify duplicates? How do we store and structure our data so that the end users can find it, visualize it, and use it in ways that add value? Ultimately, better data management should lead to more efficient and more robust analysis.

We would love to hear your thoughts, ideas, and best practices around data management. Email us at spwlayp@spwla.org if you'd like to contribute a response.

SPWLA Networking Happy Hour

There is no better way to blow off steam than raising the roof at happy hour. Whether it's TGIF or after work drinks and food, happy hour is the appropriate motivation for networking, meeting new colleagues, reconnecting with known ones or talking in a relaxed atmosphere with members of the SPWLA board or other SPWLA members. That was the main purpose during the most recent social event we had in a popular place in Houston, Texas. Almost 20 members gathered to enjoy a beautiful evening with drinks and food onboard. Members of all ages, background and experience had the opportunity to socialize while talking about technical or anecdotic events related to petrophysics. It was a very informal event but attendees enjoyed it a lot and recommended to continue organizing this type of activities. Food was provided courtesy of Harvey Rock Physics and Bill Agee, VP of Global Operations.

Don't miss our next event!

Join us for our next event to kickoff the summer season with our second 2018 SPWLA Networking Happy Hour at Cedar Creek Cafe Bar & Grill on May 17, 6:00–9:00 PM. The entire SPWLA community is invited, no need to RSVP, come at your own leisure, no payment required. Come and mingle with fellow petrophysics enthusiasts!

Everybody is welcome!

When: *6–9 PM Thursday May 17, 2018*
Where: *Cedar Creek Cafe Bar & Grill,*
1034 W 20th St, Houston, TX 77008

SPWLA's Happy Hour at Houston's Canyon Creek Cafe, March 2018

Attendees to SPWLA's Happy Hour at Houston's Canyon Creek Cafe, March 2018. Note the mix of winter and summer outfits at the beginning of the spring season, gotta love Houston weather!

Haiku of the Month:

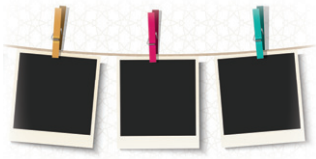
Data management – Essential but
lots of work. Why is it so hard?

Do you participate in theater, music, or the arts? We want to hear about your performances or creations! Tell us about them or send us photos at spwlayp@spwla.org or through SPWLA social media, and we'll choose some responses to publish in the next issue!

Contact us: SPWLAYP@SPWLA.ORG

We encourage you to contact us with any suggestions for improving our group and/or if interested in participating in our activities.

Send us your articles, stories, fun moments, photos, etc. to be published in The Bridge.



SPWLA ASIA PACIFIC TECHNICAL SYMPOSIUM 2018

Society of Petrophysicists and Well Log Analysts
Indonesia Chapter

CALL FOR PAPER

Theme:
Empowering Applied Petrophysical Concept and Technology: Unlocking Hidden Potentials in Mature Fields

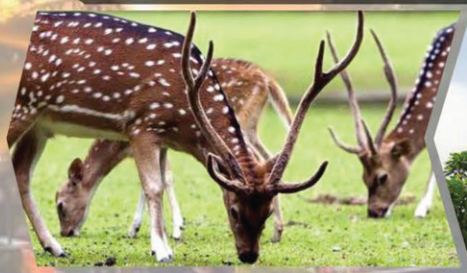
Main Topic

1) Formation Evaluation of Conventional Reservoir
2) Formation Evaluation of Unconventional Reservoir
3) Low Resistivity-Low Contrast Reservoir Pay Evaluation
4) Reservoir Characterization Case Studies
5) Geomechanics and Well Bore Stability
6) Oil and Gas Data Science and Analytics
7) New Borehole Logging Technology
8) High Angle/ Horizontal Well Evaluation and Real-Time Decision Making
9) Reservoir & Production Surveillance

Abstract should be:
- Written in English.
- Maximum 500 words in length contain: objectives, methods, the summary of the results, conclusions and keywords (It should encourage the committee to select your abstract)

Abstract Submission Deadline
May 6th, 2018

Submit your abstract to:
indonesia@spwla.org



Main Event
November 7th- 8th, 2018
Bogor, West Java

Organized by

Supported by

Further Information:
indonesia@spwla.org
Didit Putra Kusuma
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