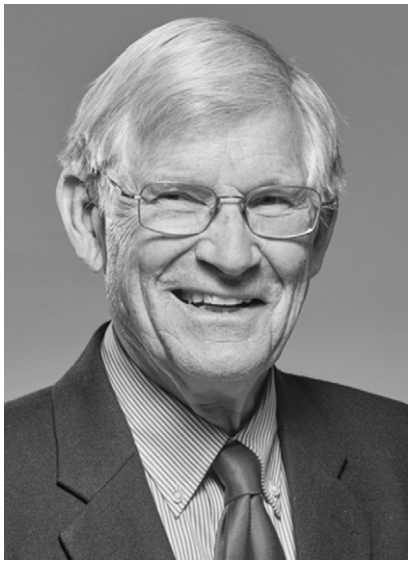
AAPG Honorees, 2017



LAWRENCE DANIEL MECKEL, JR.
Sidney Powers Memorial Award

Citation—To Dr. Lawrence Daniel Meckel Jr., who has helped shape our industry for more than 50 years, in recognition of a distinguished career that has spanned exploration, teaching, and research. Larry brings together the excitement of exploration and the application of research concepts, igniting a passion for discovery.

This year, the 100th anniversary of the AAPG, we are pleased to introduce the 70th recipient of the Association´s most prestigious award, our father, Dr. Lawrence Daniel Meckel Jr. Larry has pioneered our industry for more than half of the AAPG's first century, in a distinguished career that has spanned exploration, teaching, and research.

Larry grew up in Baytown, Texas, a refinery town along the Houston ship channel. He is the son of Lawrence Sr., a process engineer for Humble and Exxon, and Thelma Krause. He received a B.A. in geology from Rice University, where he graduated Phi Beta Kappa in 1959, and a Ph.D. from Johns Hopkins University in 1964, with a major in geology and a minor in oceanography. From 1964-1974, he worked as a research geologist, exploration geologist, and research manager for Shell Development and Shell Oil. In 1974, he and Bob Sneider (a prior Powers Award recipient) co-founded Sneider and Meckel Associates, an oil and gas consulting company of which he was a partner and vice president until 1981. Since 1981, he has been president of L.D. Meckel and Company. From 2005-2016, he also served as adjunct professor at the Colorado School of Mines. He currently teaches geology for three nonprofit organizations. Larry is a longstanding member of the Rocky Mountain Section of AAPG, the Mexican Geological Society, the Rocky Mountain Association of Geologists, the Society of Exploration Geophysicists, and SEPM.

In 2011, he was awarded AAPG's Grover E. Murray Distinguished Educator Award. In 2016, he was awarded Honorary Membership in AAPG in recognition of his informed and inspired leadership. Those previous AAPG awards highlight two of Larry's professional passions:

1. Developing and prioritizing oil and gas exploration opportunities, particularly in Canada, the United States, and Mexico.
2. Teaching industry professionals, university students, and the general public.

Larry's career in exploration reflects his unparalleled ability to think creatively and to see potential where others see problems. There is always a better way.

Here are just three examples.

- Unconventionals: Larry worked closely with a number of valued colleagues in the early 1970s at the ground floor of thinking about unconventional systems. As he says, "This was before we really understood these plays; we just realized they were 'different' from typical conventional fields." In the search for bypassed pay, they used log, test, and rock data, trap analysis, and depositional models to identify prospects. Using this new approach, the team had exploration success in the Texas Gulf Coast, Oklahoma, Louisiana, and–most notably–western Canada, where he and a team of entrepreneurial Canadian and US explorers identified the potential for an

enormous, basin-centered accumulation, which, in 1976, became the super-giant Elmworth tight gas field, one of the first recognized and documented unconventional discoveries. Subsequently, he was involved in the early work characterizing the unconventional potential of the Pinedale Anticline and the Black Warrior Basin (where he identified prospectivity in the Pottsville Formation, the same rocks he had studied for his Ph.D. thesis). His extensive success in these remarkable and industry-changing systems over more than 40 years, led Jim Gray, one of his colleagues in the Elmworth discovery, to note in his 2016 Honorary Membership citation, that Larry is a "master of unconventional petroleum systems".

- Horizontal drilling: Larry also got in ahead of the curve in the application of horizontal drilling to develop tight sands–a key to unlocking the unconventional resources. His work with Sandy McCormick and others in the early 1980s led to early drilling in the Austin Chalk and Olmos Formations of the Texas Gulf Coast.
- Mexico: It seems like Mexico has been on the industry's "hot list" forever. Larry got a head start on us all there, too; he began evaluating PEMEX's assets, at their invitation, in the mid-1990s, and has since been involved in studying the geology and prospectivity of every major onshore and offshore petroleum basin in Mexico. Among his successes, he encouraged the re-drill and deepening of a recent well that had been abandoned just above the main Wilcox objectives. The new, deeper well was the discovery of the large Arcos Deep Field in northern Mexico.

His passion for "discovery thinking" continues unabated even now. Recently, on a recreational drive across the Continental Divide through the Piceance Basin, he was noting enthusiastically how very recent advances in drilling and completion technologies could be applied elsewhere in North America and the world to unlock resources that have, until now, been considered marginal or unsuccessful. His point was, there is still enormous potential for the industry to explore new frontiers, and that no basin should escape our attention.

Bob Weimer, another previous Powers Award winner and nominator, said in 2011 that Larry is "one of the most successful and influential teachers in petroleum geology." Larry's legacy as a teacher is well established. He estimates that he has taught several thousand industry geologists over the years, and hundreds of graduate students. As they traverse industry and research, his sons are often asked by those very same professionals: "Do you know Larry Meckel?" That question always brings a knowing smile of how far and wide Larry's expertise has influenced the industry.

In his courses, Larry teaches pragmatic, indispensable skills, such as how to recognize, how to correlate, how to map, and how to identify and apply appropriate depositional models to predict good reservoirs. More important, though, are the really invaluable skills that he has championed his whole career: creative thinking (he calls it "being flexible"): the ability to synthesize and communicate key aspects of that thinking; the necessity of working collaboratively across disciplines; and–above all–respecting a wide diversity of opinions.

These skills are underpinned by three guiding philosophies:

- "So what?"
- "Be elegant and keep it to the point."
- "Show them, don't tell them."

"So what?" isn't dismissive. It's provocative. In effect, he's asking us, what can we learn from "x" to apply to "y"? What is the significance, and to whom is it significant? How can it help us make better decisions?

"Be elegant and keep it to the point" isn't about wearing a well-tailored suit, and isn't quite the same as the more well-known adage, Keep It Simple. It means work with your goal in mind, communicate your ideas with your audience in mind, and recognize that the vast majority of successful solutions are indeed elegant in their simplicity.

Lastly, if you want someone to really understand something, show them, don't tell them. Larry is never more excited than when unrolling a well log loaded with gas pay that represents an outcrop that had just been discussed at a field stop. This is where the excitement

of exploration and the application of research concepts come together, and where passion for discovery is ignited.

Coupled with those principles is his constant encouragement of his students to ask questions–of him, of themselves, of their colleagues. He has told many of us the story of when he was on a field trip early in his career, and he and his fellow students were berated by the instructor for asking too many questions, who told them: "You´re here to learn, not to ask questions!" For Larry, it's very much the opposite: "You´re here to learn; ASK QUESTIONS!"

Importantly, he himself asks questions constantly, which has been a significant component of his success as a petroleum geologist. He began his career, first as a scientist, then a manager, at Shell's renowned research and development laboratory, where the questions and answers of the problems they were investigating became the basis for his many courses in the practical application of subsurface analysis.

As important as asking the question, though, is finding the right person to ask, and Larry has always sought creative thinkers with whom he can work together to understand a problem more thoroughly, from multiple perspectives. He has said previously that "In essence, one's career is defined by key people who provide unexpected opportunities (career shifts) and those very important colleagues and mentors who provide the supervision and technical talent to accomplish those goals." His many, many collaborators and partners will agree that his recognition, appreciation and faith in the value of close collaboration, teamwork, and partnership has been a defining characteristic of his career, and instrumental to his success as both an explorer and educator.

One of his most valued partners, for more than 50 years, has been his wife, Barbara, who is herself a geologist and has worked together with Larry since the 1970s. Larry is always clear that her support and assistance has been responsible for much of his success. Their passion has been handed down: Trey is International New Ventures Manager for Pluspetrol, a major South American exploration and production company; Tip is a research scientist at the Bureau of Economic Geology in Austin. Their other sons, Bret and Kit, are successful in fields outside of geology, but have been guided by the same principles: think creatively, synthesize and communicate, work collaboratively, and respect diverse opinions.

The Sidney Powers Memorial Award is reserved for the greats–people who have had transformational and long-lasting impact. With this award for his many career contributions and achievements in petroleum geology, including exploration, teaching, and research, Larry now joins an esteemed league of explorers that, through their persistence and ingenuity, have helped shape the industry during the AAPG's first century.

Trey Meckel
Tip Meckel

Response

I am truly honored and humbled to receive the Sidney Powers Memorial Award. I thank those colleagues who considered me worthy of nomination, the Awards Committee, and the AAPG. I also thank my two sons—Trey Meckel and Tip Meckel—for their kind words in the citation and biography.

My career has spanned a number of significant and permanent shifts in exploration: (1) from structural to stratigraphic exploration onshore, (2) from automatic gain control of seismic events to map structure to the realization that true amplitude data contained valuable rock-fluid information, and (3) from conventional to unconventional resource exploration. Each shift provided exciting new opportunities. But realizing those opportunities depended on working in teams with many talented people, at different times and in different places. I was fortunate to have worked with outstanding teams at Shell Development, Shell Oil, Sneider and Meckel Associates, L. D. Meckel and Company, Canadian Hunter Ltd, and Colorado School of Mines. Trey and Tip documented the milestones of that enjoyable and exciting journey. I would like to reflect on (1) the people that were so important at those various times and (2) those

"ah-ha" moments that generate new exploration insights and lessons learned and can even entirely shift one's career direction.

I entered the industry in 1964 during that major shift from onshore structural to stratigraphic trap exploration, a change that put a strong emphasis on learning important details about the various reservoir types. I was fortunate, being just out of graduate school, as Bob Nanz assigned me to the Recent Clastics Project at Shell Development. Its objective was to document models for the various sandstone reservoirs using modern environments. Here I would work with two important colleagues and mentors, Rufus LeBlanc and Barney Bernard, both having a passion for modern processes and the resulting depositional record. From them I would learn one of the most applicable and useful lesson in my petroleum geology career, namely how to recognize, map, correlate, and predict various clastic reservoirs. With the addition of Peter Van de Kamp, Clyde Moore, and Abe Golick to work additional modern environments on the Gulf, Atlantic, and West coasts, we were able to document over 24 reservoir types, from alluvial fans at the margin of the basin to submarine fans in bathyal parts of the basin. There were two turning points: (1) the importance of calibrating logs (our most common subsurface tool) with good rock data (both cores and logs were taken in each modern reservoir to do just that), and (2) recognizing the proper reservoir model for the task at hand. These are lessons I used virtually every day. To this day, my most popular industry course is "Recent Sand Models", an attempt to document and pass on these critical lessons to others.

In 1969, R. E. McAdams (Shell's exploration vice president) said there had been an important breakthrough technology in the New Orleans Marine Division and asked me to go over for the upcoming lease sale to see if my understanding of clastics would be useful. So we packed up our two infants and did that for six months prior to the sale. Mike Forest and his team had discovered the realized the value of bright spot (true amplitude seismic) data. Another defining moment: true amplitude data had valuable rock-fluid data encoded in it. My role was to project sand facies onto each nominated block. Using updip analogues and recent models, I tried to draw an anticipated SP log for each nominated lease block. McAdams then sent me back to the Rocky Mountain Division (Denver) with the charge to quickly apply this new technology there. But rocks there were not those porous Tertiary sands of the Gulf of Mexico. So what was important: peak or trough, bright spot or dim spot, or something else entirely? The answers required a good data base of density and velocity values for not only the reservoir but the encasing seal rocks. Neither were readily available or easy. Before I really got to the application stage, I was transferred to Houston to be manager of geology at Shell Development. Here my work took a different approach. I formed a stratigraphic geophysics team with the help of Bob Talley and Joe Gittelman. It would include geologists, a petrophysicist, and geophysicists. That team would document good rock properties and develop programs to display and analyze the data. And this time the valuable lesson would again be: It is important to calibrate seismic data with good rock data to minimize the options and thus reduce the risks.

That assignment at the lab would also become an important broadening experience to appreciate the other disciplines involved in exploration: carbonates (Bob Dunham, Bob Ginsburg, Mike Lloyd), source rocks and maturity (Archie Hood, JT Smith), pressures (Fred Meissner), and secondary migration, shows, and entrapment (Tim Schowalter, Paul Hess). I am grateful to all those people who taught me invaluable lessons. In particular, it was Fred Meissner (an avid fly fisherman) who noted: "If you want to catch a fish, think like a fish. So if you want to find oil and gas, think like a drop of oil or gas." In other words, where did oil and gas originate, what forces moved it, and where and why did it stop to be an accumulation. Wise colleagues Bert Bally, Marlan Downey, and John T. Smith, would strongly reinforce that concept, namely that thinking about the entire petroleum system was absolutely critical. From then on, that approach was my "modus operandi." But that required good interdisciplinary teams.

In 1974, a Shell colleague (Bob Sneider) and I as exploration

consultants would form such a team comprising geologists (us and Leon Wells), a petrophysicist (Lloyd Fons), a reservoir engineer (John Farina) and a geophysicist (Garland Speight). We decided on a new exploration approach: use log evaluation to identify bypassed pays in old dry wells to generate new exploration opportunites. Up to that time, petrophysicists were in the production departments (1) to decide whether to complete or abandon a new well or (2) to calculate reserves in a field. Now we would use them as the "lead dog" to generate new prospects. It worked; we rapidly discovered a number of new fields from Houston down to South Texas. This was a real confidence builder. A major ah-ha moment: This was a valid exploration approach.

Then a small new Canadian company, Canadian Hunter, ask us to come up to Western Canada to apply both US clastic thinking in a predominantly carbonate exploration province and also our new exploration approach, identifying bypassed pays in older dry wells. We now had the good fortune to work with an aggressive new team at Canadian Hunter: John Masters and Jim Gray as the principles and Dave Smith, Earl Hawkes, and Duncan McGowen as the geologists. Rather quickly Fons was able to identify bypassed pay (movable gas) in every Lower Cretaceous sand in 50+ dry wells (that penetrated those sands) over a 60 township area in the deep basin. An important and critical moment: This could be something big. The first wells were disappointing; yes, gas was recovered, but at noncommercial rates. Facts are stubborn things: all the data indicated commercial gas was there! Perseverance won. Subsequent wells proved the gas was indeed there and producible. We had used the basin-centered San Juan Basin Gas Field and Wattenburg Field as our analogues. That 1976 well, a twin of a 1970 well, was the discovery of the huge Elmworth Field in what would be called the Deep Basin.

The next moment of truth came when we looked at the cores in that early discovery well. There was what Earl Hawkes calls the "beach moment." The cores showed not conglomerate channels as originally thought, but beach conglomerates which both Bob and I had worked with previously in Shell so were not an unknown. Those permeable conglomerates were also the sweet spots. A previous lesson reinforced: early core data are critical to calibrate both the model and the logs.

That was a career changer for all of us. We didn't completely understand that petroleum system (that would come later), we just realized it was very different and an important type of petroleum system. I have worked unconventionals ever since: first tight gas, then tight oil.

The 1992 to 2002 period provided two excellent opportunities to understand the model. First Rick Fritz and John Shelton of the MASERA Corporation would ask me to lead a team comprising Jim Wilson and John T. Smith to do a proprietary study of the Austin Chalk from the Rio Grande River to Lake Pontchatrain and from updip outcrops to downdip limit of the existing play. By looking at the entire system as well as the geochemisty, log resistivities, shows, pressures, and production data the new model emerged. Second, in 2004 the RMAG ask Ray Thomasson and me to give the keynote speech at a tight gas conference with these objectives: to summarize where we had been, where we were , and where we were going in tight gas exploration. This provided the great opportunity to become familiar with all the literature on these existing and diverse types of fields: Ozona, Sonora, Booneville, Jonah, Pinedale, and the San Juan Basin plus what was emerging as Elmworth developed and to put together a new model.

The next really important moment: a new petroleum system model would fall in place. The systems were dynamic and forces of expulsion (due to pressure), not forces of buoyancy (due to density differences), were the driving force. This was a huge difference from our existing thinking for conventional fields. I have emphasized the importance of this new model in each of my various unconventional courses.

In 2004 I was ask to join the faculty of the Geology Department at Colorado School of Mines. I initially taught Advanced Petroleum Geology and then started the very popular Unconventional Petroleum Systems course to draw on my more recent experiences. Here I would interface with colleagues Bob Weimer, Steve Sonnenberg,

John Warme, John Curtis, Rick Sarg, Mike Batzle, Tim Collett, Steve Cumella, and Ira Pasternack who shared their insights on other types of reservoirs and unconventional petroleum systems.

The continuing education program at Mines (SPACE) was the next opportunity; they asked if I would use my experience to give industry courses for them. I dug into my background and came up with two: "Recent Sand Models," which I had started in 1992 with Dave Smith, and a new one titled "Tight Gas Exploration." I have enjoyed teaching those courses and sharing my knowledge now for over 16 years with more than 40 companies and organizations.

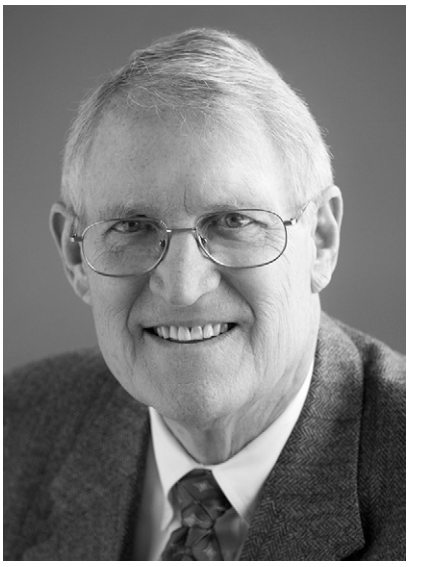
As the industry demand for courses has diminished, I have shifted my teaching to benefits for nonprofit organizations and continuing education courses via OLLI at the University of Denver. That has been a very rewarding shift, and I have enjoyed the challenge of a new and different, but enthusiastic, audience.

In summary, I have been fortunate to work with various talented teams on important projects at different times in my career. But there is a critical one person team who was there during all those periods from 1964 to present, namely my wife Barbara. She is also a geologist (we met over a lost dog in graduate school at Johns Hopkins) and has been a constant source of energy and support as a fellow coworker, an adviser, and an editor. Her support and assistance truly has made a difference. To her I am ever grateful. She is the mother for our four outstanding and successful sons—Trey, Bret, Tip, and Kit—who have had to listen to a lot of geology around dinner tables and on vacation trips. Each has done well in his chosen field, and Barbara and I are proud of them and their families. I thank all those family members for their support and love.

A second important through running entity in my career from 1974 to now has been AAPG. It has provided that very important framework for the transfer and distribution of studies, knowledge, and insights through their many publications, courses and seminars, and conventions. In my small way, I have tried to help their education efforts by teaching at their schools, visiting university departments on their behalf, giving courses, co-running convention field trips, giving convention talks, and contributing articles to various memoirs. The Meckel Family Grant (AAPG Foundation) is dedicated to graduate students who incorporate outcrop (look at the rocks!) work in their theses. AAPG's umbrella of support has been very important, and I am grateful to the AAPG organization for all their hard work, an effort worthy of all our support.

It has been a rewarding, varied, and exciting career and I look forward to the next steps. I am indeed humbled by the recognition associated with the Sidney Powers award. Thank you all ever so much.

Larry Meckel



EDWARD D. DOLLY
Michel T. Halbouty Outstanding Leadership Award

Citation—To Edward D. Dolly for his exceptional dedication to, and leadership in, the profession of geology as both successful oil and gas explorationist and active member and tireless leader of associations promoting the petroleum geosciences, AAPG and the Rocky Mountain Section of AAPG.

Born in Davenport, Iowa in 1940, Edward D. Dolly grew up in central Illinois. By the time he was in the eighth grade, he was helping his dad in oil fields in the southern part of the state, and by his junior year in high school, Ed was hooked and knew he wanted to be a geologist.

His college education began at the University of Wisconsin and continued at the University of Illinois where he received a B.S. degree in geology. He did his graduate work at the University of Oklahoma, earning M.S. and Ph.D. degrees. Ed's leadership at OU was recognized with membership in

Sigma Gamma Epsilon, National Honor Society for the Earth Sciences, and in the Society of Sigma Xi, the Scientific Research Honor Society devoted to the promotion of research in sciences.

Ed's first job as a geologist was with Shell Oil Company in Denver, Colorado. He subsequently worked for Trend Exploration Ltd. and its successor, Filon Exploration Corporation; as an independent; for James Energy Management; for Consolidated Oil and Gas; for Anschutz Exploration Corporation; and for The Houston Exploration Company. Because childhood family vacations in Colorado and Wyoming had instilled his deep love of the Rocky Mountains, Ed chose to spend his entire career in the Denver area. His exploration efforts have included work throughout the Rocky Mountain basins and structural provinces, but things he learned while at the University of Illinois about the Illinois Basin geology and at the University of Oklahoma about Oklahoma geology later played important roles in Ed's exploration efforts. During his career, which spanned over 40 exciting and rewarding years, Ed earned the reputation of being a first rate oil and gas finder. He and Norm Foster were honored with the Rocky Mountain Association of Geologists' prestigious Explorer of the Year Award in 1980 for their work resulting in the discovery of the Trap Spring Field in Nye County, Nevada.

Active participation in AAPG, the Rocky Mountain Section of AAPG, and the Rocky Mountain Association of Geologists has played an important role in Ed's professional life for more than 50 years. Almost as soon as he accepted Ed as a Ph.D. candidate at the University of Oklahoma, Professor Dan Busch, (educator and explorationist), espoused the benefits of committed participation in professional societies, particularly AAPG. Professor Busch encouraged his charges to join AAPG as students; his case for membership was compelling and Ed became a member that same year, 1965, at first reading the organization's publications and attending the annual convention.

Two other colleagues and friends, Jim Clement at Shell Oil Company, and later Norm Foster at Trend Exploration Ltd., became mentors to Ed. Jim Clement stressed the importance of the local professional society (RMAG) as a stepping stone to AAPG on the national level. Norm Foster encouraged Ed to continue his RMAG activities, but also to become a delegate from RMAG to AAPG House of Delegates, and to get involved in the operations of AAPG's leadership and governing bodies.

Over the years, Ed volunteered to serve on nine RMAG committees and chaired two. For AAPG, including the House of Delegates, he has participated on 18 committees and cochaired or chaired 6 of those. Through the RMS, Ed worked on several AAPG annual conventions held in Denver. He took on the role of technical program coordinator for the 1994 ACE, ably assisted by teammates Christine Peterson, Janet Pitman, Roger Slatt, Paul Weimer and David Budd in developing an exceptional technical program.

Further evidence of Ed's growth as a leader during his career is demonstrated in the offices he has held. Locally in Denver, he served RMAG as second vice-president, president-elect, president and counselor. He served the Rocky Mountain Section of AAPG as both its president and AAPG Advisory Council representative. Ed has also been AAPG House of Delegates chair-elect and chair, which placed him on the AAPG Executive Committee for 2001-2002 and as the HoD Representative to the Advisory Council the following year.

In 2004, an informal group of AAPG members led by Charles Sternbach met to discuss the 100th anniversary of AAPG, to occur in 2017. A committee was formed in 2005. Ed became an early member of the group, which by 2006 had developed a plan for the celebration of the centennial anniversary. Charles became the committee chair and key members in addition to Charles and Ed were Randi Martinsen, Paul Weimer, Andrew Hurst, and Rick Fritz, executive director of AAPG at that time. That group chose several projects deemed significant for the benefit of AAPG members. These projects included (1) a continued history of the AAPG as an organization, (2) a Discovery Thinking forum to be presented at the annual conventions and videotaped

for permanent access, (3) a GeoLegends interviews project, also videotaped for permanent access, (4) a collection of 100 professional papers that made a difference and why project, and (5) geologic field trips of world-renowned stratigraphic sequences or structural areas, filmed and digitally mapped.

Ed's leadership and contribution of hundreds of hours of his time over the past 10 years to the 100th Anniversary of AAPG Committee's GeoLegends Videotaped Interviews Project has culminated in a body of work that will benefit geoscientists worldwide for years to come. Ed and Paul Weimer began interviewing GeoLegends in 2007, continuing through 2016. They have interviewed and videotaped 50 GeoLegends, with the help of Charles Sternbach, Daniel Minisini, and Will Green on several interviews. Brandon Carter and John Lindgren were hired as cinematographers in Denver, Colorado and Midland, Texas respectively. Later, Pax Harris of Medium Films in Boulder, Colorado came on board as both cinematographer and post-production editor for the entire GeoLegends Interviews program. Pax was later joined in both capacities by Sam Carrothers. As the project grew, Ed became the primary geological editor, working with Pax and Sam to edit the interviews, making corrections such as removing stutters, repetition, and unwanted background noise where possible. Ed also organized the insertion of maps, cross sections, core photos, well logs, and photos of people and places mentioned in the interviews in order to enhance the final presentations.

As Charles Sternbach's Discovery Thinking Forum Program grew, Ed and subsequently Paul Weimer, helped select the talks and introduce the speakers at these highly successful forums. Originally one half-day Discovery Thinking Forum was held per ACE convention. It was soon expanded to both morning and afternoon sessions and held at ICE conventions as well as ACE.

Ed's dynamic participation in, and leadership of, the 100th Anniversary of AAPG Committee began first as committee member, then expanded to co-chair from 2008-2009, chair from 2010-2013, and currently co-chair along with Charles and Paul.

Ed's extraordinary gifts of time, vision, diligence, and dedication to "getting the job done" have been recognized with many honors and awards from AAPG, HoD, and the RMS of AAPG. Those from AAPG include the A.I. Levorsen Award in 1980, Certificates of Merit in 1994 and 1996, the Distinguished Service Award in 2000, and Honorary Membership in 2007. The HoD honored Ed with a Certificate of Merit in 2002, Honorary Member of the House in 2007, and a Long Service Award in 2012. From the RMS of the AAPG, Ed received the Distinguished Service Award in 2014.

All in all, a remarkable career of service and leadership, Ed, one richly deserving of the Michel T. Halbouty Outstanding Leadership Award. Thank you!

Stephen A. Sonnenberg

Response

I am honored to be named the 2017 recipient of the Michel T. Halbouty Outstanding Leadership Award. Leadership comes in many forms. To be included with the other 10 winners of this award, each of whom is a uniquely qualified leader in his or her own special and individual way, is further testament to the significance of this honor.

I would like to thank Steve Sonnenberg for the complimentary words he has written about my career as geoscientist, explorationist, and active participant in AAPG, the Rocky Mountain Section of AAPG, and the Rocky Mountain Association of Geologists.

It is awkward and difficult for me to write about myself in response to receiving this leadership award. I will begin by saying that I hope I have made my mentors—Dan Busch, Jim Clement, and Norm Foster—proud of me for living up to their expectations by taking to heart their advice to not only join AAPG, RMS, and RMAG, but more importantly to enthusiastically participate in achieving quality goals for each of those organizations.

I heard Mr. Halbouty speak on several occasions and each time he left a lasting impression. As a speaker, and leader, he commanded complete attention

with his eloquent and fiery delivery and was quite motivating. I had one personal meeting with Mr. Halbouty and his exploration manager, Mr. Barber. Norm Foster and I showed them our drilling project in Nye County, Nevada. Their response was that "the geology and the analog field looked good, but the prospect was too wild" for them. By the way, that prospect led to the discovery of Trap Spring Field, the second field in the state of Nevada.

Throughout my tenure with AAPG, RMAG, and to a lesser degree RMS, my participation began as a member of committees, progressing up to co-chair or chair of several as I took on more leadership responsibilities. In all cases, "I" was never totally "I." There was always a component of "we" in any group. "I" was always working with others. "We" worked together, dedicating time and effort to the committee to add value for the members of the organization. Whether it was at the committee level or as a delegate, chairman of the HoD, HoD representative to the Executive Committee and to the Advisory Council, or as president of RMS or RMS representative to the Advisory Council, the dynamics were the same – "I" was working as "we" with others to achieve a common goal. While chairman of the House, for instance, I would be remiss if I didn't mention my hard-working fellow officers, Marty Hewitt and Sandi Barber, along with two other key supporters, Lowell Lischer and George Eynon.

Over a decade ago, a group of AAPG members led by Charles Sternbach met to discuss the 100th anniversary of AAPG coming up in 2017. Although I was not present at that meeting, I soon heard about it and committed my support to Charles to help plan ways to commemorate this auspicious occasion. "We," note "we" not "I," formed the 100th Anniversary of AAPG Committee. Charles was designated chair of the Committee; later I became co-chair (2008-2009), chair (2010-2013), and am currently serving as co-chair with Charles and Paul. In 2006 four projects were chosen to celebrate AAPG's 100th anniversary.

1. Paul Weimer and I commenced work on the Videotaped Geo-Legends Interview program,
2. Charles Sternbach launched the Discovery Thinking Forum at annual conventions,
3. Randi Martinsen began the selection process for the 100 Professional Papers That Made a Difference project, and
4. Andrew Hurst and his team started work on the Outcrop Field Trip Studies program.

The Discovery Thinking Forums developed by Charles Sternbach have become one of the most popular series of talks presented at ACE (later expanded to ICE as well.) As many as 400 to 600 people commonly attend each speaker's presentation. I started helping Charles with the project in the second year and Paul Weimer later joined the team that continues through the present, selecting speakers for their discoveries and assisting with the Forums at the conventions. Each talk was videotaped and can be viewed on the AAPG website.

Paul and I began the GeoLegend project in 2007. We first defined what constitutes a GeoLegend, began a list of members whose accomplishments met our criteria, and hired a cameraman and film editor. This was all new to us, but we got started. We interviewed several people in 2007 and 2008, and began the editing process, a large part of which consisted of inserting into each videotape maps, well logs, cross sections, photos of cores, and photos of people and places associated with the subject of the interview. Since I, being semi-retired, have had more free time than Paul, I took on the majority of the editing responsibilities with Pax Harris, and later Sam Carrothers, of Medium Films in Boulder, Colorado. Paul and I did the majority of the interviewing which has continued through 2016, but Charles Sternbach, Daniel Minisini,and Will Green also interviewed several of the GeoLegends. We have recorded 50 interviews to date and would have liked to conduct more, but time and budget constraints have necessitated winding down the project at 50. I have continued to do the vast majority of the reviewing, editing, reviewing the edits, re-editing, and finalizing the videotapes with Pax and Sam for presentation to AAPG members and the public at large. The GeoLegend interviews will

soon be posted on the AAPG website and it is our intent that they be viewed, and the information utilized, by geoscientists for years to come.

I've been recognized as a leader by many of my contemporaries for the hundreds of hours put in working on this project. But I consider it more a "we" venture and "we" giving back to honor members of our association by providing the opportunity for them to tell their stories of finding major oil and gas fields, or developing new scientific techniques, or building successful companies. I've had fun learning a new trade – film production – and contributing my time to honor those interviewed as well as provide information and education for AAPG members, both current and yet to come, old and young, who will watch these videotaped interviews.

With the able assistance of Pax Harris and Sam Carrothers, "we" have completed two additional projects for the 100th anniversary of AAPG. We put together a loop tape of all the Sydney Powers medalists to date and another of the past AAPG Executive Committees, including photos of the presidents and a list of the individual officers serving with each. These tapes add to recorded AAPG history and will be available for viewing on the AAPG website.

It has been my pleasure to serve the associations affiliated with my chosen profession. The advice of my mentors has proven to be priceless. Actively participating in AAPG has benefited me every bit as much as the organization. The camaraderie of working with countless colleagues over the years has developed into many treasured friendships. The rewards have been both personal and professional. I wish to express my gratitude to Paul, Pax and Sam, without whom the GeoLegends project would not have become this extensive body of work for the AAPG. And of course I thank my family—Karmen, Lana, Hugh, Stephanie, Angelina and Tyler—for their support, encouragement and love throughout the years.

Edward D. Dolly

KATHARINE LEE AVARY
Honorary Member Award

Citation—To Katharine Lee Avary, in recognition of long-term, outstanding service, contributions to Appalachian basin geology, and her passion in aiding the professional development of students and women in their chosen profession.

Honorary Membership is bestowed on AAPG members who have "distinguished themselves by their service and devotion to the science and profession of petroleum geology and to the Association."

Having worked with Lee Avary for more than 30 years at the West Virginia Geological Survey (WVGS), including many AAPG-related efforts, I have been fortunate indeed to witness first-hand why she is so deserving of this award.

I have never considered Honorary Membership to be a "second" Distinguished Service Award. In fact, I have always considered it to be an award for continued service beyond receipt of the Distinguished Service Award, and for contributions to the science of geology over a long period of time. In Lee's case, then, she is being recognized for continued service since receiving the Distinguished Service Award in 2008, and for significant, long-term contributions to our knowledge of stratigraphy and petroleum geology in the Appalachian basin during a career that has spanned nearly four decades.

Lee, a native of Atlanta, Georgia, was educated in the south, first at Emory University in Atlanta, then at University of North Carolina, Chapel Hill, before migrating north to West Virginia in 1978 to accept an offer to join the WVGS as a petroleum geologist in the Oil and Gas Section. Over the years that followed, she became fully engaged in public service and research on subsurface stratigraphy and petroleum geology in the Appalachian basin, and eventually

was promoted to head of the Oil and Gas Section.

The beginning of Lee's career at the survey coincided with the establishment of Department of Energy's Eastern Gas Shales Program that co-hosted the 1979 Eastern Section-AAPG meeting. Lee immediately became involved, organizing and leading a field trip and writing a summary of activity in the field trip area.

Following passage of the Federal Energy Policy Act in 1978, tight sandstones as well as shales and coalbed methane gained prominence. Therefore, during the 1980s, Lee worked with another team to develop criteria with which to qualify sandstone reservoirs as tight, and then to apply the criteria to determine which reservoirs could be designated as such.

Later in her career, Lee led WVGS teams that participated in projects of the Appalachian Oil and Natural Gas Research Consortium to create, among other things: an atlas of major Appalachian gas plays; a play book for the Trenton-Black River Play; an enhanced version of the Total Oil Recovery Information System for Department of Energy; reservoir characterization studies of several oil fields; estimates of the Devonian shale resource base; and enhanced secondary gas recovery.

More recently, Lee became involved in carbon capture and geologic storage studies conducted by one of the Department of Energy-funded regional partnerships. That project produced a series of updated subsurface maps of numerous Appalachian basin reservoirs and other formations with carbon storage potential. Information compiled during the early years of that research is proving to be immensely important for a current study to determine the optimum locations for subsurface storage of liquid ethane and other natural gas liquids along a pipeline extending from the liquids-rich Marcellus and Utica shale plays to industrial centers in northeast Kentucky and southern West Virginia.

In addition to these research efforts, Lee has made major contributions in the technology transfer area, initially as the Technical Program co-chair for the Appalachian Petroleum Geology Symposium (1979–94), and more recently by developing workshops for the Petroleum Technology Transfer Council (1995-2009). Lee also was a participant in the program to identify and compile data on Preferred Upstream Management Practices (PUMP) in Appalachian oil fields (2001–03), and in developing an interactive, online geospatial delivery system to improve the availability and delivery of critical information for the development of tight sandstone gas resources in the Appalachian basin (2005-08).

Lee has a long and impressive list of service to AAPG over the past 35 years. Early in her career, Lee co-authored the Appalachian basin portion of AAPG's Correlation of Stratigraphic Units of North America (COSUNA) correlation charts (1978-83) and co-authored the West Virginia portion of the AAPG Development Papers (1978-90) while compiling data on exploration and development wells for the Committee on Statistics of Drilling.

Her emergence on the national stage began with her role as a delegate to the House of Delegates, and gradually grew into other HoD activities, AAPG committees, the Advisory Council and the Energy Minerals Division. She has been a very active HoD member, serving as secretary/editor and chair of the Newsletter Committee, and as a member of the Nominations and Elections, Credentials, Honors and Awards, and Resolutions committees. She also has served on at least nine AAPG committees, and was chair of the Domestic Sections Ad Hoc Committee (2003-04) and vice-chair of the Youth Educational Activities Committee (2001-02). Since 2000 she also has served on the Student Expo, Mentoring, Professional Women in Geosciences, Public Outreach, Committee Oversight, and Research committees.

In 2008 she was recognized for much of this service when she was presented AAPG's Distinguished Service Award. However, even after receiving this award, she not only continued to serve in the House of Delegates and on various AAPG and EMD committees, but also increased her level of participation, in several cases advancing from a committee member status to committee chair. But her two real passions seem to be in working with other women on the Professional Women in Earth Sciences (PROWESS) committee and with

students on the Student Expo and Barrel Awards committees. Currently she is serving on three PROWESS subcommittees and was committee chair from 2012-15.

Because of this very impressive record of continued service to AAPG and significant research and technology transfer contributions to benefit Appalachian basin producers, Lee certainly deserves to be recognized as an Honorary Member of AAPG.

Douglas G. Patchen

Response

I have had the honor of working with many wonderful AAPG members and headquarters staff members over the years and have learned from all of them. I have been very fortunate to have two special mentors who helped me so much.

The late Dr. John M. Dennison was my thesis advisor at the University of North Carolina, Hill. John encouraged me to pursue my research interests in a field-based thesis which also incorporated subsurface data from nearby wells. I had never been to West Virginia prior to starting my thesis field work, but John assured me that it was a beautiful state and that I would like it. He was absolutely right and I have been here ever since I finished my thesis. John made a point of making sure that all of his graduate students knew all of his other students, which provided me with a network of geologists who had studied with John. My relationship with John did not end when I finished graduate school; instead we continued to collaborate on several Eastern Section AAPG field trips, and I also participated in the AAPG field seminar, "Paleozoic stratigraphy and Appalachian exploration trends", which he led for several years in the early 1980s. When I was mapping in the Valley and Ridge in eastern West Virginia with my West Virginia Geological and Economic Survey (WVGES) colleagues in the late 1990s, John met us in the field to share his stratigraphic knowledge with us. One of these colleagues remarked to me later "Wow, that's what an advisor is supposed to be like!"

Douglas G. Patchen, my biographer, was my long-time colleague and mentor at the WVGES. He taught me so much about subsurface stratigraphy and encouraged me to become involved in AAPG. I learned a lot from Doug about being a section officer, running section meetings, and serving on committees and the Advisory Council. Doug and I worked on many research projects together; I consider the Appalachian Basin COSUNA charts and the Atlas of Major Appalachian Gas Plays (Gas Atlas) to be the most memorable. Under Doug's leadership, the Appalachian Oil and Natural Gas Research Consortium united several state geological surveys and West Virginia University (WVU) to conduct regional studies in the Appalachian Basin, including the Gas Atlas and the Trenton-Black River Playbook.

In addition to these two mentors, I also have been very fortunate to learn from undergraduate and graduate professors, colleagues, students, and many other AAPG members I have met over the years.

I am also grateful to the Girl Scouts, for giving me the skills I needed to be comfortable living and working in all types of environments. I became a geology major because of a Girl Scout wider opportunity. I spent two weeks in Ten Sleep, Wyoming, the summer before taking physical geology. On one of the field trips, we drove through the Wind River Canyon and I noticed the signs along the highway marking the different formations exposed in the canyon. One day during Physical Geology the following fall, Dr. Howard Cramer showed some slides of the Wind River Canyon, and I decided geology was going to be my major.

In recent years, most of my AAPG volunteer activities have been focused on students (WVU Student Chapter faculty advisor, Eastern Section Imperial Barrel Award coordinator, Eastern Section Student Job Quest organizer) and the work of the Professional Women in Earth Sciences (PROWESS) committee (now a Special Interest Group). I have enjoyed mentoring and encouraging students, who are the future of our profession. The PROWESS Pioneering Women in Petroleum Geology project, spearheaded by Robbie Gries, has allowed me to learn more about some of the women who paved the way in the early years of AAPG. Biographies of the first 100 women members of AAPG have been prepared, and a book and documentary video telling their stories are being produced. The day-long forum and graphical time line on display here at the 100th

anniversary meeting provide opportunities to learn more about these remarkable women.

I also benefit from my local geoscience community (Eastern Section, Appalachian Geological Society, Pittsburgh Association of Petroleum Geologists, Pittsburgh Geological Society) and as an adjunct faculty member at West Virginia University.

I am grateful for the love and support provided by my family. My parents, Robert Lee, Jr. and Jeanne G. Avary encouraged me to pursue my interest in geology. My brother, Robert Lee Avary, III served as my field assistant for my thesis field work. My husband, Allen B. Judy, supported me during my travels to conferences, field trips and workshops, and kept the dogs happy and fed. When I was going through old family papers and records a few years ago, I learned that my grandfather had been very involved in his alumni association. If there is a genetic component to being actively involved with an organization, I think I must have inherited it from him.

A great deal has changed in our knowledge of the Appalachian Basin in the past four decades. Unconventional resources have become the norm; much of the research in the late 1970s-early 1980s sponsored by the Department of Energy and the Gas Research Institute (now Gas Technology Institute) provided a foundation from which to move forward and apply new technology in the basin where it all began. Source rocks are now viewed as reservoirs and annual production records have been broken in each of the last several years in Ohio, Pennsylvania, and West Virginia. These are exciting times in our profession and industry. We need to be smart and use our knowledge and resources wisely as we continue moving through the twenty-first century.

I am grateful for the opportunities AAPG membership has afforded me and believe that I am a better geologist and better person for it. I hope to continue my involvement in AAPG and pass along some of what I have learned to the next generation of geoscientists. I encourage everyone to be as involved in the association as you can; you will reap the benefits of your involvement many times over.

Katharine Lee Avary

DAVID R. COOK
Honorary Member Award

Citation—For contributions to petroleum geoscience, AAPG, and promoting the education of the next generation of petroleum geologists.

Dr. David R. Cook is a native of Lancashire, England. He earned bachelor's and Ph.D. degrees in geology at the University of St. Andrews in Scotland, where his geologic studies and publications improved the understanding of Scottish geology. Dave enjoyed a 31-year career with ExxonMobil, during which he worked on exploration and production geology and was based in London, England; Jakarta, Indonesia; and Florham Park, New Jersey, and Kingsville, Texas, United States. His final corporate assignment as a geoscience recruiter familiarized him with the geoscience departments of many universities in Europe and the critical need to nurture geoscience talent. It also cultivated his taste for wonderful continental cuisine and Bordeaux wine. Dave's recruiting experience has directly benefited AAPG because it instilled in Dave a willingness to work with university students and encourage them to consider careers in petroleum geoscience, albeit without an expense account.

Once freed from the yoke of full-time employment, Dave began essentially full-time volunteer work for AAPG. He spent his first six years of volunteer activity serving two-year terms as president-elect, president, and past president of the Europe Region. The Region was in its infancy, but Dave worked with, and in many cases

recruited, volunteers who have built the Region into a model for other AAPG Regions. Despite being "past-just about everything" in the Region, Dave continues to serve as a Trustee of the AAPG UK Charity and to informally advise and assist as needed. Volunteers that Dave recruited continue in his path, serving with distinction on the Region Council.

From 2012 to 2015, Dave served as a co-chair of the Imperial Barrel Award (IBA) committee with Chuck Caughey. During that time, he and Chuck streamlined and documented procedures, recruited and trained volunteers, and networked with donors and sponsors to ensure the viability of the program through a period of tremendous international growth. Perhaps this is Dave's most significant contribution to AAPG: This flagship program now reaches hundreds of students worldwide each year. Dave continues to devote substantial time as an advisor to the IBA committee to ensure the continued success of the program throughout the Sections and Regions and in the global finals held annually at ACE.

Because of Dave's thorough understanding of AAPG and its many components, he is the "go-to" person for many volunteer tasks, including thorny roles in the House of Delegates and service on ad hoc committees that have required not only significant time, but careful attention to diplomacy and proprietary information. Global Corporate Structure ad hoc, anyone?

Dave is an especially valuable AAPG volunteer because he understands the big picture, including the "spaghetti diagram" that represents the AAPG organization. He engages with faculty, students, members, volunteers, and staff in a consistently professional and courteous manner. He delivers on his volunteer commitments. He strives for constant improvement in what he does and in what AAPG does.

Throughout these years of service to AAPG, Dave has retained his enthusiasm for petroleum geology through attending conferences, working with IBA teams to consider exploration problems, occasionally reviewing manuscripts for the *AAPG Bulletin*, and even observing rocks in their natural environments.

Some of Dave's motivation to contribute to AAPG comes from the many friendships he has developed and sustained throughout his volunteer career. It is sad that a few close friends, notably Vlasta Dvorakova and Peter Burri, did not live to see Dave receive this award. However, Dave is overjoyed to celebrate with fellow 2017 Honorary Member Rusty Riese, and with the many AAPG members he has enjoyed working with over the years. He is honored to join the company of Honorary Members he has long admired.

While this biography might give the impression that Dave is chained to his desk and working for AAPG all the time, he managed to get to the courthouse during a recent visit to Houston to marry his beloved Chainsaw. She constantly asks him to speak English and he motivates her to continue learning and volunteering. Together they will make time to see more of the rocks.

Gretchen Gillis and Rusty Riese

Response

I am extremely honored to receive this award. I would like to thank the Honors and Awards Committee for nominating me and the Executive Committee for conferring the award. I am also extremely grateful to my friend, Rusty Riese, and my wife, Gretchen Gillis, for writing such an eloquent biography.

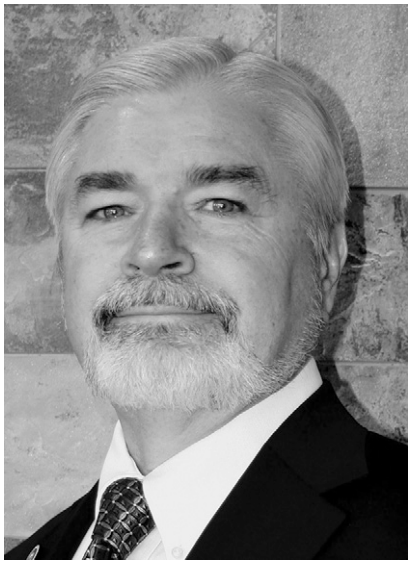
Since I joined AAPG 40 years ago I have seen the Association become more relevant to the international geoscience community as a whole and in particular to students. I have been fortunate to have been involved with the Imperial Barrel Award since 2008 and I have enjoyed being part of the development of this program, which, I believe is the best that AAPG offers to students. It is gratifying that industry and academia realize the value of the IBA in creating an interest in our business and an exceptional learning experience for students and potential future employees. I hope that we will be able to maintain the quality and ethos of this program despite the budget constraints resulting from the current economic climate.

Through my work with the Europe Region and on various

standing and ad hoc committees I have come to realize the value of AAPG not only as a professional and technical organization but also as a community. I have enjoyed both the challenge of technical discourse and of understanding the intricacies of the way the association works. Most gratifying have been the friendships developed with members from all walks of the upstream business and academia.

Thank you for this honor. I look forward to continued service to AAPG, sustaining friendships with colleagues and furthering my knowledge of our fascinating profession.

David R. Cook



STEVEN M. GOOLSBY
Honorary Member Award

Citation—The American Association of Petroleum Geologists recognizes Dr. Steven M. Goolsby's dedicated service to the Association and to the petroleum, coal, and uranium industries.

Steven M. Goolsby has dedicated his career to applying geological knowledge in minerals exploration and exploitation. He has served extensively in AAPG and the Rocky Mountain Association of Geologists (RMAG). The award of Honorary Membership by AAPG is well deserved.

Steven was born to Maurice and JoAnn Goolsby on November 26, 1952 in Paris, Texas. He grew up in and around Dallas-Fort Worth, Texas. Steve's interest in the natural world stirred as he explored the Texas woods with his brother, Mathew, and became acquainted with ticks, chiggers, snakes, fish, and fossils in local outcrops of Cretaceous Austin Chalk and Woodbine Sandstone.

In grade school Steven received his first-ever mark of A+ for a science report, an unusual event for him that lit his interest in science. His eighth-grade science teacher, Dr. Selman (a geologist), encouraged Steven to study the fossils of the Austin Chalk as a science-fair project. Steven collected and crushed chalk samples, sieved and washed the rubble, examined the results under Dr. Selman's microscope, and reported what he saw. Steven's project earned his first-ever geological award, a first-place citation and plaque from the Fort Worth Geological and Geophysical Society, further stoking his geological interests.

After high school Steven worked his way through Stephen F. Austin State University (SFA) in Nagcodoches, Texas, as a student assistant teaching geology labs and curating the sample collections. At SFA Steven was inspired by the classes of Austin Sartin (stratigraphy), Jerry Vincent (paleontology), and Herschel Jones (petrography).

Steven graduated with honors from SFA in 1975 with a B.S. in geology, and moved to Denver, Colorado. He served the US Geological Survey by assisting field work in the Cretaceous Ferron sandstone in Utah under Thomas Ryer, and in coring operations in Tertiary coalbeds of the Powder River Basin, Wyoming. Steven soon switched to uranium exploration for Geoexplorer Associates, then to sample-description work for the American Stratigraphic Company (Amstrat). He returned to coal work for the Colorado State Geological Survey (CGS) in studies of coking coal and of coalbed demethanization. Steven went underground, apparently willingly, for the CGS in order to sample several active coal mines.

Surviving these hazardous experiences, Steven discovered how comparatively well-paid his brother Mathew was as a well site geologist. In 1981 Steven became a well site geologist for Aquarian Consultants, Inc., using the some of the methods that he had first used for his science-fair project. Soon after, and despite the miserable post-oil-crash economic environment of the 1980s, Steven and Mathew optimistically opened their own well site geology business, Goolsby Brothers and Associates (GBAI). Steven's first-ever

recommendation to drill stem test a drilling well resulted in oil and gas recoveries for the client. Since then GBAI has thrived, and serves both domestic and foreign clients. Currently Steven also is a partner in Coyote Oil and Gas, a Denver exploration and consulting company with production in the Bighorn and Williston basins.

Steven served from 1981 through 1988 under John Masters' legendary leadership at American Hunter Exploration (AHEC), and aided the AHEC team in early exploration of the Bakken play in the Williston Basin. More recently for Vecta Oil and Gas, Steven caused the drilling of an early horizontal test-well in a resource oil play in the Cretaceous Greenhorn Shale of Colorado, and has been providing petrophysical evaluations of resource plays for Vecta's sister companies Foreland Resources and Verdad Exploration.

Steven still serves as a consulting geologist and petrophysicist for well-known oil and gas companies. Some of the more challenging petrophysical services he has performed have been in the oil deposits of Venezuela, as well as plays in Africa, China, Colombia, and Russia where well logs can be difficult to evaluate.

During these work-filled years Steven managed to further his education. After 11 years as a part-time student at the Colorado School of Mines (CSM), in 2008 Steven gained his doctorate in geology with a minor in petroleum engineering. At CSM Steven "sat at the feet" of such luminaries as Robert Weimer, John Warme, and the late Fred Meissner. His doctoral dissertation (John Curtis, advisor) treated the turbidite sandstones of the Cretaceous Lewis Formation in Wyoming.

Somehow Steven has found time to teach courses in hydrodynamics, sample description, petrophysics, and log analysis. He has authored papers, posters, and talks on coal and carbonate geology, coalbed demethanization, turbidites, hydrodynamics, low resistivity pay, capillary trapping, pore network characterization, petrophysics, neural network/ inversion modeling, and oil and gas exploration. He also fathered and raised a loving family.

Steven's service to the AAPG has been extensive and long-lived. Steven joined AAPG in 1978, and has served AAPG and its House of Delegates (HoD) continuously since 2002. Steven is an active member of the Energy Minerals Division (EMD) and the Division of Economic Geology (DEG), and is a Certified Petroleum Geologist under the Division of Professional Affairs (DPA). Steven has both served on and chaired numerous committees of AAPG, HoD, DPA, and DEG that were charged with convention and technical coordination, preservation of samples and cores, employment, honors and awards, and credentials, among other duties. He has served as treasurer for the DPA and as secretary/editor of the HoD, and was thrice nominated for chair-elect of the HoD.

In addition to his service to AAPG, Steven also has been an active member of HGS, WGA, SPE, SPWLA, SIPES, and DWLS. He has filled several posts for the RMAG, including president (2008), and was made an Honorary Member of the RMAG in 2010. Steven was inducted into Sigma Gamma Epsilon and Alpha Chi, which are honorary scholastic societies. The HoD has awarded Steven its HoD Recognition of Service Award (2004), Distinguished Service Award (2014), and Distinguished Member of the House Award (2016).

Steven is dedicated to geology and, in fact, to all the natural sciences, in and for themselves. But he also is committed to applying science to the search for mineral wealth. Steven's services to the minerals industries and to AAPG have been extensive and long running, and continue to this day.

Ed Coalson

Response

When AAPG President Paul Britt called to tell me that I had been selected by my peers to receive the AAPG Honorary Membership Award I was completely surprised. To be truthful, my first thought was that he was calling to ask me to volunteer for some other duty within AAPG! To be perfectly clear, that would also have been ok. It has been a privilege to work within AAPG over the years, and I don't think it is possible to repay the association for all that it has done for both my personal life and for my career. It is truly an honor to receive Honorary Membership Award, and I would like to thank whomever nominated me, the AAPG Executive Committee, and the Advisory Council for selecting and

approving this distinction for me. I would also like to thank my business partner and close friend Dr. Ed Coalson for writing my bibliography.

As Ed mentioned, I fell in love with the natural sciences as a boy. My brother Mathew and I played endlessly in the woods and fields around our home in Arlington, Texas. We collected fossils and rocks, including fossilized shark and skate teeth from sandstone outcrops, gypsum crystals from of the nearby clay banks, and echinoderm fossils from Austin Chalk road gravel in the area. My parents encouraged this curiosity, and pushed us to excel in our education (sometimes successfully). The result was that we both grew up to graduate as geologists, and we are still business partners in geological consulting to this day.

My enthusiasm for the earth sciences was readily apparent to my eighth-grade science teacher, Dr. Selman. He encouraged me to do a science fair project on micropaleontology, and loaned me his equipment to do the work. Knowing what I do today, I am convinced he had his equipment to perform oil and gas well site geology. I won a first-place award at the Texas State Science Fair from the Fort Worth Geological and Geophysical Society that year. I urge all of my peers to view this experience which led me into my career as proof that we can never support and praise our public school teachers enough for all that they do for their students.

My first experience with AAPG was in 1975 while I was still an undergraduate geology student at Stephen F. Austin State University in Nacogdoches, Texas. Several of my professors encouraged their students to attend the AAPG national convention in Dallas that year. I signed up as a student attendee and went to the convention. I also attended a short course given by Dr. James M. Coleman on finding and exploring ancient deltas in the subsurface. I was extremely impressed with the science and professionalism I encountered at the meeting, and I resolved to associate myself with AAPG going forward.

Two of the most influential mentors I had the privilege to work with during my early career were both employed in the public sector. Dr. Thomas Ryer broadened the scope and limits of my geological background while I was employed as a US Geological Survey summer field assistant for him. His patient discussions with me on stratigraphy and sedimentation while mapping the Ferron Sandstone on the Wasatch Plateau in central Utah were priceless to my expanding perspectives of the science. I was later employed with the Colorado Geological Survey, where my supervisor, Keith Murray, first introduced me to the need to network with others within the profession by joining local and national geological associations. It was at this point in my career under his encouragement that I first joined AAPG as a member in 1978.

During this time I became aware of the cutting edge geological research being done in the oil and gas industry, and I became enamored with the excitement of working in the industry. When my brother Mathew suggested I join him doing oil and gas geological well site supervision I jumped at the chance. After working briefly for another consulting company, he and I formed our own company in 1981, which we named Goolsby Brothers and Associates, Inc. We are completely compatible as business partners and have consistently backed each other in our professional dealings since forming the company. His support, and that of my loving wife and family, has allowed me to volunteer my time and efforts over the years in supporting the AAPG and other geological associations.

A few years after we formed our company I got a call from Ed Coalson, one of the geologists we had been doing well site geological supervision for. Ed offered me a job as a geotech with American Hunter Exploration. At the time, I was president of my own company and had 15 other geologists working for me. However, I knew Ed was one of the best exploration geologists in the business, and so I took the position knowing I would learn exploration geology from a master. Within a year I became an exploration geologist working for John Masters looking for "elephants." After American Hunter closed their Denver office, I rejoined Goolsby Brothers and later Ed and I partnered to start Coyote Oil and Gas. Although that business and Goolsby Brothers continue to this day, I have also worked for several other exploration companies in the last few years.

My business career has lent impetus to the need of every oil and gas geologist to be a member of AAPG and to participate in the organization. To be successful in this business you must have several strengths provided by AAPG. You need the cutting edge science provided by the society of course, but you also need the business proficiency and professional networking it provides. In addition, AAPG has provided me with a world of personal friendships. I deeply appreciate the support of my family and business partners which allows me to volunteer at AAPG, and I am profoundly honored to receive this distinction from the society.

Steven M. Goolsby

LESLIE B. MAGOON
Honorary Member Award

Citation—To Les Magoon, the "father" (with his good friend Wally Dow) of the petroleum system concept, in honor of receiving the AAPG Honorary Member Award for 2017. It was truly an auspicious moment when Les arrived as a fresh-faced employee at Shell Oil in 1966 and was introduced to Clark Kent…a sign that surely set the stage for a super career.

Les may never have become the source rock expert that he is today were he not to have taken as much chemistry as he did during his undergraduate and master's studies at the University of Oregon. On his first day of work at Shell Oil Company in Los Angeles, he was taken down to the basement, shown a desk piled high with journal articles, and told he had two weeks(!) to become an expert on source rocks. When asked why he was chosen for the task, his superiors replied that he had more chemistry than most in the company. Les' immediate task was to prepare Shell management for the offshore lease sale in the Santa Barbara Channel. By working with such luminaries as John Castaño, Archie Hood, and Marlan Downey, Les refined his knowledge of source rock geochemistry. Within a few years, Les transferred to Farmington, New Mexico and later to Denver to carry out source rock studies throughout the Rocky Mountains. Following a brief stint in Houston, Les returned to his Bay Area roots in 1974 when he became a research scientist at the US Geological Survey (USGS) in Menlo Park. Upon his return to California, Les literally knelt down and kissed the ground at his beloved private camp near Mount Hamilton in the hills above San Jose. He was happy to be home!

Of Les' many contributions to petroleum geology and geochemistry, the most revolutionary one was the refinement and subsequent codification of the petroleum system concept, now immortalized in the best-selling AAPG memoir of all time, *Memoir 60, The Petroleum System—From Source to Trap*. Although that book was published in 1994, it had its roots more than 20 years earlier. Les discovered at an AAPG meeting in 1972 that he and his colleagues at Shell were characterizing source rocks and migration pathways in the Williston Basin in a similar manner as Wally and his colleagues were at Amoco. A late night meeting with Wally in a dorm hallway 12 years later at a Gordon Research Conference sealed Les' fate. Between 1987 and 1991, Les integrated Dow's oil system with Perrodon's petroleum system, Demaison's generative basin, Meissner's hydrocarbon machine, and Ulmishek's independent petroliferous system. Les stood on strong shoulders when he synthesized the best concepts of these previous works with those of his own developed during years of studying source rocks and oil samples.

Les spent countless hours writing and editing chapters of *Memoir 60*. Much of this work was accomplished at his camp, away from the distractions of the office. It is through this diligence

that each chapter of *Memoir 60* applies the petroleum system concept rigorously to settings around the world. Many of these chapters are now landmark papers in their own right. In recognition of the importance of this publication, *Memoir 60* was awarded by AAPG the Robert H. Dott, Sr. Memorial Award in 1996. Following the publication of *Memoir 60*, Les disseminated the petroleum system concept in keynote speeches and classes in Mexico City, Jakarta, Rio de Janeiro, and Bucaramanga (Colombia), among other places, and on an oil company "tour" to Arco, Chevron, Elf Aquitaine, Exxon, Mobil, Shell, Total, and Unocal. Les truly revolutionized the USGS when, in 1996 and 1997, respectively, both the World Energy Project and the National Oil and Gas Assessment Project in the Energy Program adopted the petroleum system methodology for assessments of undiscovered oil and gas.

Les left his mark in other ways at the USGS. In the 1970s and 1980s, he became a worldwide expert in the petroleum systems of Alaska, both in the Cook Inlet and across the North Slope. With colleague George Claypool, Les developed a petroleum geochemical program for the numerous USGS wells drilled during a multimillion dollar exploration campaign in Alaska. Through this effort, he coordinated an innovative research project that culminated in perhaps the only large-scale comparison that exists of 30 geochemistry labs in industry, academia, and government worldwide. Not only did this effort foster international communication between the stakeholders, it established that inter-laboratory variability in geochemistry results is a fact of life. The results of this study were presented in *AAPG Studies in Geology No. 20 Alaska North Slope Oil/Rock Correlation Study* in 1985.

Les has served the industry in professional societies throughout his career. For the past 40+ years, he held numerous positions in the Alaska Geological Society, AAPG, Northern California Geological Society, and Pacific Section SEPM. He continues to teach the petroleum system concept in his short course with AAPG Continuing Education.

Les began a new phase of his illustrious scientific career after retiring from USGS in 2004. Recognizing the power of integrating the petroleum system concept with technical computing, Les co-founded (with Ken Peters, Mike Moldowan, Steve Graham, Carolyn Lampe, and Bjorn Wygrala) at Stanford University the Basin and Petroleum System Modeling Industrial Affiliates Program. As a consulting professor, Les co-teaches two courses in the curriculum, courses that he co-developed. Equally as important, Les helped to advise nearly 20 graduate students during their tenure in the program. It is no exaggeration to say that Les' expertise, gained from studying oil samples and source rocks in sedimentary basins worldwide, has contributed significantly to the growth of these students as scientists, nearly all of whom are employed in the industry today. It is a highlight of my own career to call Les my closest scientific colleague, and an even higher honor to call Les my dear friend.

Les, you may have met Clark Kent on your first day as a petroleum geologist, but without a doubt, you are the real Superman of our industry! Congratulations on this well-deserved award!

Allegra Hosford Scheirer

Response

The honor of being nominated for the AAPG Honorary Membership Award is beyond my expectations as a longtime member of our august society. I joined AAPG in 1966 while a graduate student at the University of Oregon (UofO) at the encouragement of my thesis professor, Dr. Ewart Baldwin, so we could attend an annual AAPG meeting. He chaperoned his students to our first meeting where at the icebreaker we all huddled together, unsure of what to do next. Dr. Baldwin gave us encouragement then said, "Go forth and press the flesh so you can learn from those more experienced." As dutiful students, we went forth and learned a great lesson. Regardless of your level of knowledge or skill, knowing your fellow geoscientist provides you with opportunities that will enrich your professional life.

Another professor while at UofO that loomed large throughout my professional life is Dr. Walter Youngquist, a paleontologist, stratigrapher, and

oil finder who went out of his way to keep in touch with "his" students. He also encouraged membership in AAPG. Because of his many personal connections in industry, he introduced us to recruiters. Even today, in his nineties, he keeps in touch. In addition to my academic training, these professors provided an important first step in my career development by advocating for AAPG.

After graduation in 1966, I went to work for Shell Oil Company in Los Angeles as an exploration geologist in the Ventura-Santa Barbara basin as lead geologist in the first "oil source and migration study" to prepare for the 1968 federal offshore sale. I continued this type of work in the southern Rocky Mountains from the Farmington, New Mexico office and then in the northern Rocky Mountains from Denver, Colorado. There in 1972, I attended the annual AAPG meeting where Wally Dow presented his ground-breaking oil system paper on the Williston Basin. My project was in the Big Snowy trough to the west in Montana so I was keenly aware of the oil being produced from the Tyler Formation in both areas. Thus the lesson that these AAPG meetings provided me was the opportunity to share ideas and information. This had a profound impact on both Wally and my careers in the years to come. Shortly after this assignment, I transferred to Houston to work for Shell Pectin in the international arena where I quickly forgot about the northern Rocky Mountains.

In 1974, while branch chief for the Oil and Gas Branch of the US Geological Survey, Peter Rose hired me to work in Menlo Park, California, to carry out oil and gas assessments in the Western Region. Eventually, I worked under Chuck Masters assessing oil and gas provinces outside the United States. During this time, assessments were managed by Dick Mast and carried out with a modicum of geology using the play concept but relied mostly on petroleum related statistics, such as sizes and numbers of oil and gas pools. As an exploration geologist steeped in oil source and migration studies, I was disappointed that geochemistry and geology were largely absent from the assessment process.

In 1982, Richard Buffler invited me to participate in Deep Sea Drilling Program Leg 81 in the Caribbean Ocean just north of Cuba. For a month, the Glomar Challenger's science and drill crew recovered core from the sediments below. During my 12-hour shift I ran the Rock-Eval pyrolysis machine on samples and on the other shift my colleague cleaned the machine. When I finished running samples I read petroleum geology and geochemistry books and articles to see if I could develop a methodology to incorporate geology and geochemistry into the assessment process. By this time, I had 15 years experience in oil and gas geochemistry so my effort started there with oil-to-oil and oil-to-source rock correlation; few geologists felt comfortable with those concepts…after all, a geologist deals with rocks, not the fluids that come out of them. In that month on board ship, I realized that when oil and gas was expelled from a thermally mature source rock it had to migrate to the first trap and so on using a distribution network. A "system" describes this network just like an electrical system has a generator, wires and output devices, but this system distributes petroleum, hence a petroleum system was the appropriate term.

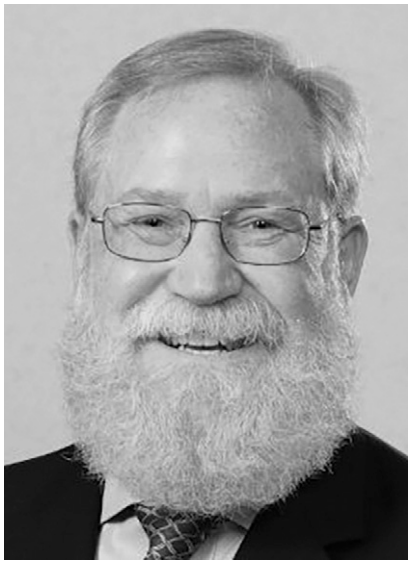
When I returned to Menlo Park, I found resistance to my holistic idea of the petroleum system because most geoscientists felt that this concept was covered in basin analysis. At this point I put together a poster session that I presented at the 1987 annual AAPG meeting in Los Angeles. My next poster session was at the Gordon Research Conference on Organic Geochemistry in New Hampshire in 1989. Late at night, after the poster session, from down the dark hall I heard, "Hey Magoon, I came up with that idea years ago." I said "Wally, is that you?" At that moment, we talked about his frustration that his "oil system" failed to catch on even after it was published in 1974 in the *AAPG Bulletin*.

We teamed up, he from industry and I from the USGS, to find ways to increase awareness about this methodology. Wally got the organizing committee to agree to half-day oral and poster sessions in the 1991annual AAPG meeting in Dallas. These sessions succeeded beyond our wildest dreams. From this date, the petroleum system term permeates the literature and meeting themes. In 1994, *Memoir 60 The Petroleum System—From Source to Trap* was published and experienced considerable success as a book and

CD. We received the Robert H. Dott, Sr. Memorial Award in 1996. Since 2005, I have been involved in the Stanford University Industrial Affiliates Program entitled Basin and Petroleum System Modeling.

The AAPG has been an important career thread that provided the mechanism to reach beyond myself to all petroleum geoscientists. I am grateful to Don Lewis who nominated me for this award and to Allegra Hosford Scheirer for being my biographer. To all my colleagues and friends who have made this Honorary Membership Award possible, thank you very much.

Leslie B. Magoon



WALTER "RUSTY" RIESE
Honorary Member Award

Citation—For dedication to petroleum geoscience, teaching, and volunteerism of enduring benefit to AAPG, while simultaneously serving as Dom Pedro II, Emperor of the Universe.

Dr. W. C. "Rusty" Riese grew up on the mean streets of New York, not far from neighborhoods where outcrops might be less common than rocks thrown through windows, yet the words "gentleman" and "geologist" come to mind immediately when thinking of him. While the term "gentleman geologist" might conjure the image of someone leisurely pondering science, Rusty has pursued geoscience in a most unleisurely manner.

Rusty earned his B.S. in 1973 in geology from the New Mexico Institute of Mining and Technology and his M.S. in 1977 and Ph.D. in 1980 from the University of New Mexico. He is a Certified Professional Geologist, a Certified Petroleum Geologist, and a Licensed and Registered Geologist in the states of Texas and South Carolina.

Rusty's career spans widely in minerals and petroleum as a geologist, geochemist, and manager during more than 39 years in industry. Rusty has written extensively and lectured on various topics in economic geology, including biogeochemistry, isotope geochemistry, uranium ore deposits, sequence stratigraphy, and coalbed methane petroleum systems. His papers have garnered multiple awards from the Energy Minerals Division of AAPG. He holds numerous domestic and international patents. He has many years of teaching experience, including 30 years at Rice University, where he developed the curricula in petroleum geology and industry risk and economic evaluation. He participated in the National Petroleum Council evaluation of natural gas supply and demand for North America, which was conducted at the request of the Secretary of Energy, and in the more recent analysis of global supply and demand requested by the same agency. As he puts it, "I've been fortunate throughout my professional career to be able to live in two worlds, with one foot in industry and one in academia."

Rusty has shown dedication and competence in a wide variety of AAPG roles: candidate for president-elect, vice president sections, committee chair and vice chair, committee member, and delegate. He was selected as the Ethics Distinguished Lecturer and was a highly sought-after speaker during his tenure. He is a Trustee Associate of the AAPG Foundation. Throughout these many roles and many years of service, Rusty has consistently inspired confidence in AAPG. His AAPG track record—spanning more than 40 years—speaks volumes about accomplishment, commitment, and dedication.

During our time together on the 2008-10 Executive Committees, Rusty was a thoughtful and attentive executive, supporting a wide range of initiatives and programs, but providing loyal opposition where he felt it was needed. Perhaps his greatest strength in that role was his understanding of the intricacies and nuances of the organization, and how that complexity makes

life difficult for all involved. Rusty also provided sage advice about legal counsel that served to protect AAPG as an organization.

Rusty tells the story of a gentleman and his family who took him into their home when he became ill during his first summer internship. "At the end of the summer, when I told him that I hoped I could repay him some day, he just laughed. 'You just pass it on,' was his charge to me. So that's why I do the things I do," Rusty says.

Rusty retired from BP in 2010, his final position being globe-trotting trouble shooter. In "retirement," Rusty has found numerous ways to share his insights and talents. He is amassing an impressive collection of long guns from the era spanning the American Revolution to the American Civil War. He remains engaged in the AAPG House of Delegates and the AAPG Foundation Trustee Associates. He is known to his closest associates as "Emperor of the Universe" after an illuminating visit to a museum in Brazil. He is frequently mistaken for Santa Claus during the festive season. A recent addition to his many titles is "Grandpa."

Throughout our many years of being colleagues, Rusty has been generous with advice about careers, geology, and pedagogy. He has also been an extremely reliable grill master, even when his grill required last-minute welding on Thanksgiving morning. We are honored to be among his friends and loyal subjects.

Rusty's education in geology, his outstanding career in minerals and petroleum exploration, his publications and work in academia, and his enduring service to AAPG make him well-suited for honorary membership in the world's largest group of petroleum geoscientists. Please join us in congratulating Rusty for this well-deserved recognition.

Gretchen Gillis, John Lorenz, and Kay Pitts

Response

Well, how does one respond to something like this? I am honored and surprised, pleased and grateful; all simultaneously.

Toward the end of his life, my undergraduate advisor and friend, Clay Smith, allowed himself to wonder if he had made any difference in the world. He had dedicated his life to teaching, had in fact been a wonderful teacher, and I found it sad that he should have doubts about his impact. So I told him I was giving him a homework assignment. "You're giving *me* a homework assignment?!?" He was incredulous. I said yes I was; that I would be sending him a film to watch, a Richard Dreyfus film titled *Mr. Holland's Opus*, and I expected him to have viewed it before my next visit.

On arriving at his home for lunch with him and his wife, Sallie, some weeks later, we passed through their living room and there on top of the stack beside the television was the film I had sent. And yes, it had been opened.

We had a very pleasant hour or two together and he saw me to the door as I was preparing to leave. As he turned to step back inside he very quietly looked at me and said: "It's always nice to see that one's handiwork has turned out well." He had gotten the message.

We in AAPG endlessly argue and debate about the nature of our Association. Are we a professional organization? An industry organization? A scientific organization? Just what exactly is the AAPG? I submit to you that AAPG is in part a platform and framework from which we can each select and build our own families—scientific, professional, and, to some extent, personal. We coach and mentor one another; we share in one another's trials and hardships, and we celebrate our accomplishments together; we shelter one another when we need to or when we can, and we share our tables as often and as liberally as possible. In short, we help one another grow and mature both personally and professionally. Aren't these the things that families do?

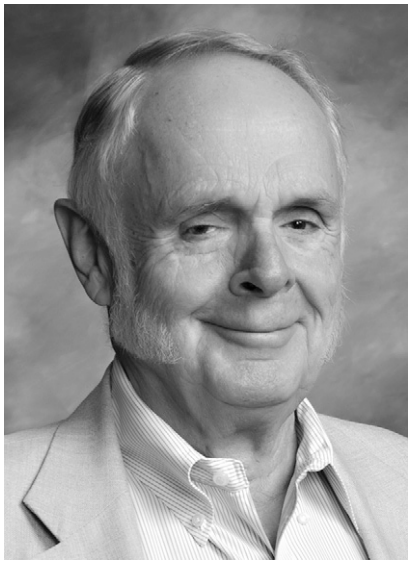
I am humbled that my AAPG family has recognized me with this award. Throughout my life and association with AAPG, I have received so much in terms of scientific enlightenment, professional development, personal growth, and lifelong friendships. The recognition that this award represents shows me that my efforts to give back and to pay-forward have been appreciated.

Now that I am now in the autumn of my careers I find myself asking the same questions that Clay was asking: Have I

made any difference? An award such as this, coming from the peers whom I greatly respect answers that question, so I thank you for that—for that affirmation, and for validating Clay's opinion that his handiwork had turned out well.

Thank you.

Walter "Rusty" Riese



JAMES P. ROGERS
Honorary Member Award

Citation—To James Rogers, a distinguished geologist with an extensive background in geologic principles, four decades of contributions to the Association and affiliated geologic organizations, and an exceptional enthusiasm for geology.

James P. (Jim) Rogers is first and foremost a highly motivated and very well-trained geologist with a strong desire to share his knowledge and insights with others through technical publications, scientific talks, and focused geologic discussions. I first met Jim in 1981 when I moved to Denver and he was active with his own consulting company that he had formed six years earlier, National Geological Services. In our 35 years since that first meeting, we have collaborated on many projects, jointly published half a dozen geologic papers, and worked in a variety of ways to strengthen the geologic community in the Denver area.

Jim first burst into the petroleum business in 1953 after obtaining his B.S. and M.S. degrees in geology from the University of Michigan. After brief work as an engineering trainee at Gulf Oil, Jim joined Shell Oil where his time was spent at four regional offices, with temporary assignments to Shell Development in Houston and Coral Gables (Florida). During these assignments, Jim worked with a host of luminary geologists including Bob Ginsburg, Gene Shinn, Tom Rollins, Rufus LeBlanc, H.A. Bernard, and Robert Nanz. These associates and mentors served Jim well as he learned about both carbonate and siliciclastic depositional systems and how they help shape hydrocarbon reservoirs. One of his early and significant success stories at Shell came during the 1960s with the discovery and development of the Pennsylvanian Tyler Sandstone reservoir at West Dickinson Field in the North Dakota portion of the Williston Basin. More than two dozen wells were eventually drilled to develop the multi-million barrel Tyler oil accumulation; Jim proposed and supervised many of them, learning valuable skills in working with both cores and cuttings along the way.

In 1968 Jim was asked to open a division office for Cleary Petroleum in Denver, breaking the bonds of comfort with "mother Shell." His tenure with Cleary exposed Jim to the wide world of the "deal," and the responsibility to work independently in petroleum prospecting. It was these technical and business skills that he built on to establish National Geological Services. Through his company, he advised and educated some of the major companies as well as large independents on reservoir characteristics, using rock data to improve exploration efforts across much of the US, and as far away as Indonesia. As National Geological Services matured, Jim also turned toward applying his lithologic talents to generating, defining, and marketing prospects across eastern Colorado and into Kansas and Nebraska.

Instead of resting on his scientific and financial success and spending more time at his beautiful second home on Virgin Gorda in the British Virgin Islands, Jim reached out to the Denver geologic community by contributing his talents, time, and energy to organizations including AAPG, RMAG, and SIPES. He was elected president of RMAG during the industry-challenging year of 1986. He also expanded his list of publications with seminal papers dealing mainly with Paleozoic reservoirs including the Pennsylvanian sandstone at Sleepy Hollow Field (NB), and the Mississippian ("Chat") chert reservoir at Glick Field, and the

conglomerate reservoir at Garfield Field in Kansas. He also co-edited a well-received special theme issue of the *AAPG Bulletin* in 2001 that focused on chert reservoirs across North America, and was the senior editor of the RMAG's 2014 digital guidebook on Colorado oil and gas fields. Jim's most recent major publication, released in RMAG's *The Mountain Geologist* in January 2015, was a detailed look (with prominent co-authors) at the Yuma Arch, a subtle but important Late Paleozoic structural feature in northeast Colorado that has had a major impact on Pennsylvanian reservoirs in that area.

Jim's numerous contributions to AAPG are surely deserving of this Honorary Member Award. The first of these was when he joined the Environmental Geology Committee in 1971 some 45 years ago. That was followed by a decade of serving on the AAPG House of Delegates, several years on the Division of Professional Affairs (DPA) Executive Committee, a term as president of DPA (1991) and on various convention committees. He also served as an Associate Editor for the Bulletin for almost 20 years and was awarded AAPG's Distinguished Service Award in 1994.

Through all his geologic contributions and professional commitments, Jim has remained a devoted family man, happily married to his charming wife of 63 years, Barbara, with whom he raised three very successful children. These children bore Jim and Barbara five grandchildren, a great-grandson and a great-granddaughter. We can only hope that some of Jim's offspring bring some of the same dedication to the geologic profession as he has shown for so many decades. Through his many years of distinguished service to both AAPG and its affiliated geologic organizations, Jim clearly merits recognition as an Honorary Member.

Mark Longman

Response

Obviously I am immensely thankful for this Honorary Membership, and honored by the those peers that made it possible. But I thought it presumptuous in this response to add more "thank yous" to those that Mark Longman has so capably included in his very thorough biography. Those who helped me along the geological "road" are legion. Any feeble attempt to mention them individually would denigrate all those not mentioned. You know who you are! Thanks!

Instead, as a "response", I would like to list a few great joys in my earth-science journey; highlights that made all the pitfalls (we all have them) seem inconsequential. So here are some "high points"; happy recollections that I hope will prompt every reader to remember all the good times in their geological career.

June, 1953: at my family home in New Jersey: received a report from the Registrar of the University of Michigan, listing grades for my last semester in grad school. My previous academic record was so mediocre that this final (glowing) grade report relieved any doubt about Michigan granting my M.S. degree; it was seriously in jeopardy until that day. Seven hundred miles away in Michigan, the lady I was to marry later that month, when she heard of my grades, breathed as much relief as I had. Barbara Townsend (to be Rogers) had rightfully wondered if I was an employable husband?? After 64 years, I think she's finally convinced.

January, 1954: in the oil patch at Kiefer (Glenn Pool), Oklahoma, I had just finished my last tower on the (Gulf Oil) pulling unit that had been my introduction to petroleum engineering "training." While it was most satisfying for a "college boy" to withstand six months of hot, dirty oil-patch labor, there was great relief in moving on to more "intellectual" work. But I'm proud to say that "staying the course" on the pulling unit earned the respect of that "earthy" crew.

Spring, 1957: the Shell (successor to Gulf for me) exploration manager called me in to his office in Wichita, Kansas. I wondered if some professional calamity was about to occur. Instead I was told to travel to Shell Development Company laboratories in Houston, for the first of many Shell clastic seminars. The first seminar was five months of intensive field and laboratory study of modern sandstones, their depositional environments and their application to subsurface reservoir studies. This was a golden opportunity to learn from giants in the geological profession, at the very birth of a whole new world in exploration technology. It was

heady work for a junior stratigrapher. While the seminar itself was worth another lifetime of learning, I didn't get rid of that damn job classification for another full year!

Christmas week, 1959: another similar and welcome surprise. Assignment to Shell's marine lab in Coral Gables, Florida for eight months, an opportunity to study modern carbonate sediments in the Florida Keys and on the Bahama Bank. Talk about exposure to world-class scientists! Several of us from "operations" were rotated through the marine lab, and had the great pleasure of learning at the feet of the "master" (R. N. Ginsburg). And it was "warm!" And there were sharks! (But I'll let Gene Shinn tell that story.)

Summer, 1967: at the Zahradnik No. 1 well site near Dickinson, North Dakota. The Shell field engineer was my constant (and unwelcome) companion during that wildcat well-site experience. He had bet me a case of beer that the core point I had just picked for the top of the Tyler was flat-out wrong. He also declared that our first core would recover zero feet of Tyler sand "pay." I sure enjoyed a large part of that cold case of beer while packaging 50 feet of continuous, oil-saturated Tyler sandstone core in foil, for lab analysis. As if the engineer's disrespect was not enough of a burden: when I called in the drill-stem test results from the cored interval (flowed oil to surface), the Shell manager in Denver accused me of being drunk, and told me to come back to the Denver office immediately; "no more lies!" I guess I had consumed a few more of those cold beers than necessary, but they tasted soooooo good. Dickinson field development continued for many months.

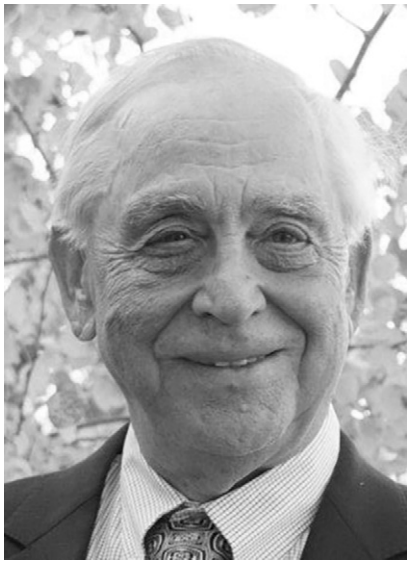
June, 1980: at Currigan Hall, the predecessor to the Denver Convention Center, John Lockridge labored intently to organize the many volunteers required to efficiently produce a national convention. This was in the day of dependency on many local-society convention volunteers; long before the advent of a large AAPG convention staff that performs so well today. As chair, Lockridge was a superb leader, full of endless enthusiasm and good ideas. John "made" that convention! He asked me to edit the abstracts and produce the technical program book, a schedule of more than 400 papers and posters. It seemed like an endless chore, utilizing editing skills that I didn't know existed. The biggest responsibility was to provide the visitor with a simple plan/device to maximize his/her convention attendance at as many desirable and timely presentations as possible, and avoid those presentations of no personal interest. With colleagues, I produced the very first, pull-out "time table" to do just that. It worked! Every visitor could see at a glance his/her hourly and daily options.

December, 1995: The "Glick Story" made the press! Mark and I had slaved for weeks over the cores, cuttings, correlations and maps that we used to explain Glick Field, Kiowa County, Kansas, the largest single gas reservoir/trap that produces from "Chat" in the US. (Spivey-Grabs is bigger, but hardly "single.") "Chat" is that mysterious, ubiquitous, weathered Mississippian chert reservoir that once contained nearly 500 BCF at Glick, and is still producing handsomely today, 75 years after discovery. "Glick" was fun, and we were honored to have Lynn Watney call it "classic".

There we more earth-science events that provided me with happy memories during this century, but somehow the early events were more fun. Except of course, April 2nd, 2017. Now that was real fun!

Sincere thanks!

James P. Rogers



TERRY MATHER

Norman H. Foster Outstanding Explorer Award

Citation—To Terry Mather for a multi-year exploration effort which ultimately led to the

discovery of economic gas, condensate and oil, creating a new significant play in a virgin basin in the previously non-producing state of Idaho.

Oil and gas exploration largely involves taking the same data set that is widely available to most geologists and geophysicists and using creative interpretation to develop previously unrecognized plays and prospects with significant economic potential. Successful oil and gas plays, projects and prospects are among the truest forms of wealth creation.

Terry Mather throughout his more than forty-year exploration career exhibited the creativity, perseverance and tenacity to convince peers and other explorationists of the economic potential of a remote, frontier opportunity. The success of the "Boise Basin Play" is one of several commercial successes in Mather's career and is clearly the most significant.

Born February 5, 1943 in east-central Wisconsin, Terry entered the University of Wisconsin, Madison in the fall of 1961 where he immediately declared a geology major. This resulted from his childhood interest in rocks which began with exploring gravel pits composed of the Wisconsin age glacial till near his home. Terry was especially attracted to the weathered shale cobbles which contained Paleozoic fossils. Following completion of his bachelor's degree from the University of Wisconsin, Terry entered the University of Colorado, Boulder in the fall of 1965 to begin graduate studies in geology, obtaining a Master of Science in 1967, and a Ph.D. in 1970.

Dr. Mather's professional career began with Shell Oil Company in 1970. An early assignment was to study and assemble a company "folio" on the Absaroka sequence, with primary focus on the Permian Phosphoria Formation for the Rocky Mountain Division. Another major assignment involved field work and evaluation of the Bristol Bay and Kodiak shelf areas of Alaska.

Mather's prospect generation efforts began with accepting a position with The Superior Oil Company in Denver. He next worked with Houston Oil and Minerals (HO&M) where he generated prospects in the Williston Basin and a successful gas prospect on the Rock Springs uplift, Wyoming. Immediately following Tenneco's acquisition of HO&M, Mather joined a select team made up of former HO&M explorationists in the Denver office of High Plains Exploration. Here he was charged with developing high impact "Frontier" opportunities. High Plains is where the formative ideas on the Idaho play originated in 1983.

While at High Plains, the Idaho play was first sold by Dr. Mather to an independent Denver operator. The purchaser drilled one unsuccessful well on a well-defined seismic and gravity "central basin high." This same, seismically tempting, but largely sediment barren feature, had been the target of previous unsuccessful attempts by the likes of El Paso, Chevron, and Halbouty. Dr. Mather's play concept was to explore the thick sediment wedges on the deep basin flanks of the central basin high, much like the analogous Portiguar Basin of Brazil.

The seismically defined sediment packages away from the high are also the location of a few early twentieth century shallow wells, some of which encountered significant shows including gas flows up to 400 MCF/D. Adding value to the play is the fact that a ready gas market exists in the area as a large gas transmission line with available capacity bisects the basin. Additionally, Idaho Power recently put on line a gas fired power plant in the immediate area.

Dr. Mather's Idaho play remained largely idle during the period from 1986 to 1996 due to the formation of Lariat Exploration where Dr. Mather teamed up with a long-time business partner. Lariat's focus was conventional oil primarily on the central Kansas uplift and the DJ basin of Colorado and Nebraska. Over the ten-year run, Lariat was responsible for more than 60 exploratory and development wells drilled. Several highly commercial oil and gas discoveries in Kansas and Colorado resulted, and all continue to produce today. Lariat's exploration approach was heavily two-dimensional seismically oriented and featured "rifle-shooting" or leasing only the prospect acreage and on-seismic line drilling. Early in 1996 at least two Denver independent

companies had decided the "J" Sandstone of the DJ Basin was a deep basin, gas pervasive, formation. A blanket leasing effort by these two companies ruined the rifle-shooting approach. Dr. Mather and his business partner elected to part ways at that point but remain good friends to this day, both appreciative of each other's creativity, contributions and friendship.

A rebirth of the exploration effort for the Boise Basin Play happened in August of 1996 when Dr. Mather became an associate of Thomasson Partner Associates (TPA) headed by Ray Thomasson, former AAPG president. Mather became a sales point person and prospect and project generator for TPA. This association and the professional contacts made available to Terry, were instrumental in moving the Boise Basin Play forward. The concept was sold to a large independent which led to the acquisition of a 4000-square-mile, high-resolution, aeromagnetic (HRAM) survey flown over the basin. As part of the contract with the acquiring company, in the event they elected not to continue pursuit of the play, Dr. Mather could use the HRAM data in-house to aid in a sales effort to other potential clients. This survey was key to tying the limited available seismic to the known seismic leads, and showed many more large and some smaller leads in areas where no in-house seismic was available. The acquiring company had the all-to-familiar change of management that took the Idaho play "off their plate" and back into TPA's portfolio.

Further exposure of the Boise Basin Play to a number of large independents and at least one familiar major led to some probing questions that furthered the sales effort but did not result in a sale. The two biggest risks for the project were (1) thermally mature source rock volume, and (2) reservoir quality at depth. Dr. Mather was able to establish the presence of organically rich lacustrine shales and coaly sediments. The question of maturity was resolved by establishing the basin to be an area of high heat flow. The reservoir and source rock volume questions remained risks.

Eventual purchase of the play by a local Denver independent was what led to the expansion of the seismic base and revelation of the discovery drill site. It was this independent's agreement with Dr. Mather's play concept and a willingness to accept the risks involved in a rank wildcat area, and their astute exploration approach that led to the drilling of the ML Investments 1-10. The well had a reported initial flow potential of 6 MMCFG and 100 BC per-day. This success and pre-price decline development drilling caused the State of Idaho to form a never-before-existent Idaho Oil and Gas Commission. The development drilling has resulted in a number of additional producers, some of which eclipse the results of the ML 1-10 well as well as revealing interesting surprises. This early drilling also contributed to a clearer understanding of the Miocene and Pliocene, non-marine clastic stratigraphy of the basin, and answered questions about some of the perceived risks.

In Dr. Mather's file on the Boise Basin Play is an article from the January 1992 *AAPG Explorer*, authored by Thomas Barber titled "Giants Await Discovery." Number two on Barber's list is the west flank of the Idaho Batholith, or Mather's Boise Basin.

Dr. Mather feels that he has been very fortunate to have been associated with all of the creative, intelligent, sharing, honest, business savvy people in his professional life, many of which will make a solid deal on no more than a hand shake. Mather feels some of these same people were instrumental in the eventual success of the Boise Basin Play and other successes during his long career. To all his business and personal associates Dr. Mather states his enormous gratitude. His personal life has been equally gratifying. Philosophically, Dr. Mather feels that he was so incredibly fortunate to have been born when he was and within the United States. He believes that no other generation in the history of mankind has had the freedom, peace, opportunities, comforts and quality of life he and his generation have been blessed with.

M. Ray Thomasson

Response

Receipt of the Norman H. Foster Outstanding Explorer

Award is a recognition I am honored to accept. A quest that began in 1983 with assembling data in a "frontier" area of Western Idaho and Eastern Oregon was stimulated by published reports of hydrocarbon indications in water wells and the few exploration attempts. Early data assembly and encouragement from associates and especially my former business partner Jack Eells, led me to become increasingly convinced that a complete and active hydrocarbon system existed in a then barren basin in the nonproducing State of Idaho. When told of the success of the project Eells commented, "How many explorers can lay claim to opening a new basin, let alone a new state? When was the last?"

As any geologist/geophysicist can imagine, convincing potential investors, or management, to spend precious exploration dollars in such an unproven area is, to say the least, daunting. The data assembly, interpretation and sales effort turned into a nearly thirty-year fun and subsequently rewarding challenge. Interestingly, in an article in the January 1992 *AAPG Explorer* by Thomas Barber, titled "Giants Await Discovery" this area was among the seven Barber listed, and was number two on the list.

My 20 year association with Thomasson Partner Associates (TPA) headed by past AAPG president M. Ray Thomasson, allowed me to present the project to a number of qualified potential clients with the added credibility of the project being TPA vetted. Interest in the project from occasional investors created additional data important to my understanding of the basin and its potential. Sale of the "Boise Basin Project" to a Denver independent and this independent's further acquisition of data, and agreement with the play concept, interpreted basin geometry and lead focus areas, led to the drilling of the ML Investments 1-10 well with an initial potential of 6 MMCFG and 100 BC per day. This success resulted in the State of Idaho having to create an oil and gas commission for the first time in history. Further, pre-price decline development drilling resulted in a clearer understanding of the target Miocene and Pliocene nonmarine clastic sediments of this extensive basin. The development drilling resulted in successful and even more impressive results and some unexpected surprises. Enormous potential remains in this lightly drilled near virgin basin.

Thus it is with much gratitude to those whose encouragement, critical advice and the opportunities created, that I tip my hat to all contributors to the project including others unmentioned. Also to the AAPG Executive Committee and Advisory Council who saw fit to grant me this honored distinction, you have my heartfelt thanks.

Terry J. Mather

JULIE A. LEFEVER
Robert R. Berg Outstanding Research Award

Citation—Julie A. LeFever for her nearly 40 years of study of the oil-bearing rocks in the Williston Basin and for her willingness to freely share her knowledge with industry scientists, professors, and graduate students.

Julie Fowler was born and raised in Los Angeles, California. She received her undergraduate and master's degrees in geology from California State University, Northridge. Her master's thesis "Structural Analysis of Mesozoic Deformations in the Central Slate Range, Eastern California" was under the guidance of George C. Dunne. In later years, while in the midst of a North Dakota winter, Julie frequently recalled the unbearably hot conditions she endured in the Mojave Desert and Death Valley while doing her graduate fieldwork.

Julie and Richard D. LeFever were married in 1976. In 1980, Rich became professor of

sedimentology and stratigraphy at the University of North Dakota. Soon thereafter State Geologist Lee C. Gerhard, knowing a good opportunity when he saw it, hired Julie to work as a subsurface geologist for the North Dakota Geological Survey. In those early years, Julie was mentored by both Lee and Sidney B. Anderson, the head of the Survey's subsurface program. Sid started with the Survey in 1952, shortly after oil was discovered in the state, and had a near-photographic memory when it came to well logs. This was back in the days of 20-foot-long cross sections made from Xerox-reduced logs taped to graphed vellum paper. Julie spent countless hours with Sid in the Survey log room discussing log tops, thinning and thickening formations, and changing lithologies. At first she listened intently, soaking in his knowledge. Before long she was an active participant, expressing how she thought the log correlations should be. Julie co-authored more than a dozen articles with Sid and/or Lee during those early, formative years.

In 1989, Julie became manager of the Wilson M. Laird Core and Sample Library in addition to her subsurface geologist duties. The Survey was short on office space, so for the next 19 years her office was in what had previously been a clean lab. During that time her desk was an ergonomically incorrect chemical bench, her walls were book cases, and her office door was nonexistent. But as she did with so many things, Julie made the best of it.

In 1990, Julie authored her first paper on the Bakken Formation (Mississippian/Devonian). She would go on to author or co-author more than 50 Bakken papers, earning her the affectionate nickname of "Miss Bakken" among those working in the Williston Basin. In 2015, the Rocky Mountain Section of AAPG awarded the 2015 John D. Haun Landmark Publication Award to Leigh C. Price and Julie for their 1992 paper titled "Does Bakken horizontal drilling imply a huge oil-reservoir base in fractured shales?" (in J. W. Schmoker, E. B. Coalson, and C. A. Brown, eds., *Geological Studies Relevant to Horizontal Drilling: Examples from Western North America*: Denver, Colorado, Rocky Mountain Association of Geologists, p. 199-214.)

Julie authored more than 150 papers, articles, posters, maps, etc. on the Paleozoic and Mesozoic rocks in the Williston Basin. Twenty of those were collaborations with her husband Rich and in later years more than two dozen with Stephan H. Nordeng. Although she made a significant contribution to the literature on the Williston Basin and the Bakken Formation in particular, it was her readiness to share her wealth of knowledge, much of it unpublished, with others that set her apart from most researchers. Countless industry geologists, professors, and graduate students benefited from Julie's spontaneous, one-on-one core workshops in the Wilson M. Laird Core and Sample Library.

As recognition of her valuable service, one of the core laboratories in the recently expanded Wilson M. Laird Core and Sample Library was named in her honor during the building dedication on September 26, 2016. During that ceremony, Julie heard from industry and academia how valuable her contribution had been to them.

Julie was thrilled when she received word from AAPG President Paul Britt on November 16, 2016 that she had been selected to receive the 2017 Robert R. Berg Outstanding Research Award. Unfortunately for all of us, Julie passed away three weeks after hearing of the award. Fittingly, at the time of her death she was working on a Bakken paper. Julie, along with her contributions to the geologic community, will be greatly missed.

Edward C. Murphy

FOWZIA ABDULLAH
Distinguished Service Award

Citation—To Fowzia Abdullah, for her dedicated service to AAPG and as a teacher and

inspiration to generations of graduate and undergraduate students in Kuwait.

Fowzia Hussain Abdullah was born in Kuwait City, Kuwait. She is a sister of a family of five other sisters and two brothers. Fowzia's parents encouraged education and science at an early stage of her primary school. She was a distinguished and honor student since primary school. This level continued in her secondary and higher study stages where she finally was part of a class of honor science students.

Her love of learning science was obvious since she was a child where she accompanied her father during his gardening, learning all issues relating to plants. Her parents expected her distinguished scientific future, but she lost them at the age of 18 years old. It was a hard time for her but it created a personality of a hardworking, self-dependant, and patient person.

Fowzia joined Kuwait University to study geology in 1978 and graduated with an honor B.Sc. degree in 1982 and was awarded by the Amir of Kuwait in her graduation ceremony.

Her professors encouraged her to do her master's degree, where she chooses to merge computer language study with geology. She had to study FORTRAN language to write her computer model application in petroleum geology. At that time, FORTRAN was one of the most difficult computer languages and programming involved many subroutine programs for even drawing a line.

During her master's study she worked as a teaching assistant in the Earth and Environmental Science Department where she become more familiar with academic life. After having her master's degree (1987) and during her two years' work as a researcher in Environmental Department, she presented her work at scientific conferences.

Her field trips to study the geology of Jordan and Cyprus, besides her ambition, encouraged her to continue her Ph.D. study as she had a scholarship from Kuwait University. She joined Imperial College London in December 1988. Her new life in the UK gave her new experiences and created a new network with her colleagues from many countries around the world. Female geologists from Arab countries were very rare, this created more challenges in Fowzia's life.

Her Ph.D. study was on Kuwaiti source rocks, where she brought her samples from Kuwait Oil Company (KOC), her starting point of cooperation with oil industry. During her study, Kuwait was invaded by Iraq, 1990, which added more success challenges in her life and to become a good ambassador of her country, as her Ph.D. supervisor described her.

After having her Ph.D and DIC in 1993, she joined her department at Kuwait University. She taught more than 12 courses, for graduate and undergraduate levels in geology and petroleum geology. Through her cooperation with KOC and other international oil companies she initiated a petroleum geology specialization (track) in her department, as well as a petroleum geology research lab. Her field of interest is source rock evaluation, basin modeling, and reservoir characterization. She supervised many master's theses in petroleum geology and was a member of many of the examination committees.

Fowzia became a member of many international societies such as SPE, EAGE, EAOG and SPWLA. She has been an AAPG member since 1989. She is the advisor of an AAPG student chapter since 2008 where Kuwait University shared in the Imperial Barrel Award regional competitions three times. She was the Middle East Region committee advisor for five years and a member of the Distinguished Lecture Committee for two years. She contributed as a scientific reviewer in many AAPG conferences and meetings, as well as chairing presentations sessions in these conferences. She led one of the field trips associated with an AAPG workshop in Kuwait in 2015. Fowzia initiated a regional AAPG workshop in early 2016 on source rock studies in the Middle East.

Being a female geologist let her present many talks in regional conferences on women in science and has a role in encouraging many female students to study geology in Kuwait.

Her experience of more than 20 years in the field of petroleum geology is also shared by being a part-time advisor in KOC for one year. Currently and for more than a year she has been working as

part-time consultant in Kuwait Institute of Scientific Research Petroleum Research Centre. She has been the director of a joint master's program in petroleum engineering and geosciences since 2013.

Fowzia has published many papers in international journals. She has also written many articles in Arabic journals.

In her free time, Fowzia practices one of her hobbies, painting on canvas with oil colors. She participated in many national art exhibitions and some of her paintings were sold in these exhibitions.

Fowzia Hussain Ali Abdullah

ANWAR M. AL-BEAIJI
Distinguished Service Award

Citation—For tireless leadership, mentoring of new volunteers, and sustained, continuous service to AAPG and petroleum geoscience.

Anwar M. Al-Beaiji was born in 1979 in a small city in northeastern Saudi Arabia, where he lived until he graduated from high school. Being one of many children in his family, Anwar was expected to help out from an early age. A formative experience for Anwar—at the age of 11—was helping his father run his gas station during the first Gulf War in 1990. He recalls practicing English with the visitors who came to his town. This friendliness and interest in meeting people from other places is one of Anwar's defining characteristics.

During high school, Anwar realized that he wanted to work for Saudi Aramco, the largest oil company worldwide. His interest was sparked by three of his older brothers working for the company. Since they were all engineers, the obvious choice for Anwar was to become an engineer. After graduating from high school, Anwar moved to Saudi Aramco headquarters in Dhahran in 1997 to pursue Saudi Aramco's College Preparatory Program, which prepares selected high school graduates for college degrees in geosciences, engineering, and other fields.

Anwar was offered a scholarship to study geology at The University of Tulsa. He thought that sounded interesting, but wanted to know more about what geologists do at Aramco. He learned that in 1938 a brilliant geologist made a critical decision that shaped the oil and gas industry globally: chief geologist Max Steineke's efforts and persistence led to the first commercial oil discovery in Saudi Arabia at the Dammam-7 well. Anwar seized on Steineke as a role model, and also was inspired by the great success of His Excellency Mr. Ali Al-Naimi, the former Minister of Petroleum and Mineral Resources of Saudi Arabia and the first Saudi national to become the CEO and president of Saudi Aramco, who is a geologist. Anwar made the sensible decision to become a petroleum geologist, even though he is outnumbered by the engineers in his family!

After earning his B.S. degree in geology from The University of Tulsa, Anwar received his M.S. degree in petroleum geoscience from Imperial College, London.

I met Anwar in 2007, the year that he joined AAPG and competed in the AAPG Imperial Barrel Award (IBA) program, where he and his team from Imperial College won the Selley Cup.

Anwar then began six years of service as the first IBA coordinator in the Middle East Region from 2008 to 2014. Thanks to his tireless leadership and mentoring of new volunteers, the program is now firmly established and receives generous financial support from industry partners in the Region. I witnessed this firsthand by attending the festivities surrounding the 2012 Middle East Region competition in Bahrain.

Anwar has volunteered for other important AAPG programs, such as Young Professional activities, the Visiting Geoscientists Program, and Student Chapters, and he was a recent candidate for

AAPG treasurer. He has provided sustained, continuous service to AAPG and is a remarkable role model for the young professionals we are trying to attract and retain as AAPG members.

Anwar joined Saudi Aramco in 2003 as reserves geologist. He has progressed to the role of team leader in the Pore Volume Assessment Division, where he is immersed in technical work and economic analysis. With the support of Saudi Aramco, Anwar spent the 2015-16 academic year at Rice University, where he pursued a master's degree in energy economics, culminating in the position of Summer Fellow in Energy Studies with OPEC in Vienna. Anwar is obviously trusted to be a good steward of company projects of exceptional scope, duration, and financial significance. Anwar's extensive travels and extended residency abroad give him an informed perspective on geology and the industry.

Anwar is the proud husband of Reema and father of three young daughters, Sana, Aseel, and Halah. As the song by the Talking Heads goes,

> "… You may find yourself In another part of the world And you may find yourself Behind the wheel of a large automobile And you may find yourself in a beautiful house With a beautiful wife And you may ask yourself, well How did I get here?"

In Anwar's case, it is clear that his personal drive, interest in learning, and enthusiasm for the automotive world got him "here."

I am confident that Anwar will continue to serve AAPG in important volunteer capacities. His AAPG track record speaks for itself in terms of accomplishments and dedication. Anwar is a most worthy recipient of this Distinguished Service Award, and I am honored to be his friend and colleague.

Gretchen M. Gillis

SYLVIA ANJOS
Distinguished Service Award

Citation—To Dr. Sylvia M.C. Anjos, in recognition and appreciation for her leadership and enthusiasm in promoting petroleum geosciences in Brazil and her dedication and service to AAPG, ICE's and GTW's.

Sylvia Maria Couto dos Anjos started her service to AAPG with the foundation of the affiliated Brazilian Association of Petroleum Geologists (ABGP) in 1997, which contributed to the first AAPG's 1998 International Conference and Exhibition (ICE) ever held in Brazil. In 2009, the AAPG´s ICE was brought again to Rio de Janeiro and Sylvia assumed the role of technical chair and VIP program co-chair. Since 2009, Sylvia has served as the vice president and president of ABGP. In 2016, she became the vice president of AAPG´s Latin America and Caribbean Region. For nearly 20 years, Sylvia has worked relentlessly to bring important AAPG events to Brazil. She chaired the Brazil Country Sessions at the ICE events in Colombia and Mexico, and the special technical sessions during ICE Milan and ICE Istanbul. She also represented AAPG in the OTC Brazil program in 2015 and 2017. Sylvia was also the general chair of the International Clay Conference held in Rio de Janeiro in 2013 and in 2015 was the general chair of the first Brazilian Petroleum Conference "Carbonates from Genesis to Production."

Sylvia´s current passion and focus are directed to promoting the AAPG Geoscience Week Program, the AAPG Youth Chapters, and integrating them into the ABGP Training Curriculum and the "Geologists of Tomorrow" program she is proud to be associated along with the Federal University of Rio de Janeiro.

In 1984, Sylvia earned her master's degree in clay mineralogy and shales diagenesis, and in 1987, she received her Ph.D. in sandstone reservoir characterization and diagenesis, both from the University of Illinois in Champaign-Urbana. She earned

an MBA in 2001 from Fundação Getulio Vargas, Rio de Janeiro and has completed Advanced Managerial Training at Northwestern University, Kellogg School of Business in Chicago (2004) and at INSEAD, France (2007).

Sylvia started working at Petrobras in 1979, a month after she earned her bachelor's degree in geology at the Federal University of Rio de Janeiro in Rio de Janeiro, the city where she was born and lived for most of her life. Her first position at Petrobras was as a well-site geologist in the onshore Reconcavo Basin. In 1980, she moved to Petrobras' Research and Development Center (CENPES), headquartered in Rio de Janeiro, where she worked and coordinated the x-ray diffraction, SEM, and petrology labs and worked in the sedimentology and stratigraphy departments. Clay mineralogy has always been an interest of hers, which led her to coordinate several studies on both siliciclastic reservoirs and shales. Sylvia was the leader of integrated research projects for the various basins and oil fields in Brazil, including reservoir quality prediction and basin modeling of onshore and offshore basins. During this time, she actively participated in Petrobras' graduate program in partnership with Brazilian universities, where she lectured courses and advised various master´s and Ph.D. theses. At Petrobras, she was also in charge of technological collaboration programs between Petrobras, universities, and research centers in Brazil and abroad.

In 1999, Sylvia started her managerial career as the manager of the Rock Technology Team of CENPES. In 2003, she progressed to manage the Stratigraphy and Biostratigraphy Group. In 2005, she moved to Petrobras' headquarters in downtown Rio de Janeiro to assume a role of the manager of the Petroleum System Modeling Group of Exploration.

In 2006, Sylvia was nominated the general manager of Geology Applied to Exploration, which included the stratigraphy, structural geology, basin modeling, geological technology and rock and fluid database departments. She also coordinated Petrobras' rock and fluid labs of various operational units of Petrobras in Brazil. At that time, the pre-salt was discovered and Sylvia played an important role in spearheading a shift in the corporate mindset for geoscience technology and capability development, from a strong "turbidites geoscience" culture to the "new world" of the complex microbial carbonates.

During her more than 37 years at Petrobras, Sylvia is proud to have been able to contribute to the company's growth, from producing small to medium-size fields onshore of Brazil to discoveries of large turbidite fields in the Campos Basin's deep waters and the giant pre-salt carbonate reservoirs in ultradeep waters of the Santos Basin in the last decade. This journey allowed the fulfillment of the long-time dream of Brazil for self-sufficiency in oil, and thus, energy independence.

Sylvia joined the Libra Joint Project Team in September 2016 and is currently the applied technologies deputy general manager on the giant Libra Development in the pre-salt Brazil.

In her private life, she is a Christian, and is thankful to God for her achievements in both her professional and personal life. Sylvia cherishes her family and three lovely daughters. As a Carioca, she likes outdoor sports and plays beach tennis on the weekends.

Sylvia Maria Couto dos Anjos

MARY BROUSSARD
Distinguished Service Award

Citation—To Mary Broussard, in recognition of her dedication, leadership, mentoring and long-term service to AAPG, as well as GCAGS, Imperial Barrel Award Competition (IBA) and the Lafayette Geological Society.

Mary's career has epitomized the broad ideals of service to the geological community at every level. She has worked with university students, local societies, as well as regional and national professional organizations which enrich our professional community. She has been an active and valued member of AAPG since 1983 and has since worked on various committees and was an integral asset to the Gulf Coast Section Imperial Barrel Award competition, where she not only helped with organizing the section competition, but also sponsored/mentored student teams from the University of Louisiana for several years. She is employed full-time and yet has been able to find the time to be a dedicated contributor to professional organizations and to help and advise aspiring graduate students while continuing to have a life as wife and mother.

Mary grew up in Tulsa, Oklahoma, and says her father inspired her interest in the geosciences. For the majority of her career Mary has been working throughout the Gulf Coast Basin, including the shelf and deepwater. Her career began in Texas, processing onshore seismic data and she has since worked as a development and exploration geoscientist for Marathon Oil, Unocal, Stone Energy, Plains Exploration and Production, Freeport-McMoRan Oil and Gas and is currently an advisor with Anadarko Petroleum Corporation. Her M.S. thesis, on fault seal analysis, was presented at the 1995 GCAGS Convention and won the A.I. Levorsen Award from AAPG for the paper that best exemplified creative ideas in oil and gas exploration, written while she was working with Marathon Oil. She loves Gulf of Mexico geology—the challenges, the constant learning, and especially the excitement of searching for that next discovery.

Mary has an undergraduate degree in geology and geophysics from The University of Tulsa and a master's degree in geology from the University of Louisiana at Lafayette. Outside of work and volunteerism, Mary loves spending quality time with her husband and daughter, Katherine Grace. She is also extremely grateful to her patient and understanding husband Stan, who learned early on that she is a true volunteer at heart and loves giving back to her community.

Mary has a long history of service to professional organizations, including the Lafayette Geological Society where she held every office including president in 2003 and was awarded Honorary Member in 2015, as well as general chairman for the 2006 GCAGS Convention in Lafayette. Her leadership skills and attention to detail as general chairman resulted in an extremely successful convention. Not long after the convention, Mary again came to the rescue for GCAGS when the Continuity Committee was formed and she accepted the role as chairman. Since the Continuity Committee was a combination of the Convention and Long Range Planning Committees, it had significant responsibilities. She once again expertly fulfilled her duties, even remaining as chairman for an extra year while refining the efficiencies of this new committee. As chairman, she also played a key role in creating the much-needed and extremely detailed "Operations Manual" for convention planning. This manual has become the "bible" for all future convention organizers. Mary was awarded an Honorary Membership of the GCAGS in 2016.

Mary's service to the professional community has also included service on various AAPG committees including Section Presidents chairman (2015-17), Gulf Coast Section Visiting Geoscientists coordinator (2014-16), Advisory Council (2010-13), Officer Nominations chair (2012-13), Membership Committee (2012), and member of the House of Delegates (2007-09). She served the GCAGS as vice president in 2012-13 and president 2013–14, where once again she displayed qualities of dedication and intense hard work far beyond what is normally required in these positions. Mary received the AAPG Certificate of Merit in 2015.

Please join me in recognizing Mary's continued dedication and service to AAPG by honoring her with this Distinguished Service Award.

Amy Wharton Vanderhill

RICHARD D. FRITZ
Distinguished Service Award

Citation—To Richard D. Fritz for visionary leadership of AAPG including Executive Director and DPA President and for exemplary service to AAPG as author, editor, speaker, and teacher.

Richard D. (Rick) Fritz is a country boy who grew up in the oil patch of Oklahoma. The most natural thing for him to choose as a career was geology. Like most of us, he probably thought being a geologist meant he would be earning his living in the open air. Despite having to spend most of his career indoors, Rick thrived as a geologist as evidenced by his many accomplishments, especially with respect to AAPG.

His accomplishments while at AAPG as executive director are well known and were recognized in part by his receipt of a special award during his tenure. Parenthetically, his work for the AAPG Foundation is reflected by a significant increase in its financial worth. After his resignation from AAPG in 2011, he has had leading roles including Division of Professional Affairs president, help in compilation of an AAPG memoir, as well as continued work for the Foundation.

He wanted to be a geologist as a youngster. When he was 13 years old, he served as a helper to his dad, Charles Fritz, who was a pumper in the oil fields of Oklahoma. There Rick met geologists and decided that he wanted a job like theirs because they drove nice cars and wore fancy clothes. He enjoyed talking rocks with them and it was probably then that he learned he would need to have an advanced education to land a job as a geologist.

Rick choose Oklahoma State University (OSU) as the place to begin his geological career. He credits his professors John Shelton, Gary Stewart, John Naff, and Zuhair Al-Shaieb with teaching him to work hard and instilling in him a love of geology.

John Shelton says that it wasn't just Rick's hard work that got him through his structural geology class. He remembers that Rick had a natural ability to make realistic maps and cross sections, something that usually takes most students a while to learn.

Rick greatest discovery was Mary Carl, a Skiatook girl. Rick and Mary dated in high school and eventually fell in love. They were married at the beginning of Rick's junior year. Rick and Mary both worked while they were students at Oklahoma State.

Most people working on M.S. degrees in geology will study the geology of several townships or a county. Not Rick. Rick does things on a grand scale and his master's thesis was no exception. Rick's thesis was the Pennsylvanian subsurface structural geology of most of Oklahoma, with preparation of structural contour map, with thousands of control points, and cross sections.

Before his OSU graduation, Fritz had an opportunity to work on North Sea geology in London with ERICO. After graduation (1977), he took a job with Exxon in Kingsville, Texas. For the next five years, he worked South Texas and Anadarko Basin reservoirs, putting a prodigious number of prospects together in a very short time.

In 1982, Rick began his work for ERICO, Inc. (later Masera Corporation) in Tulsa, Oklahoma. Fritz was the project director for Masera's domestic studies. These studies included the Red Fork, Spiro, Jackfork, Misener, Hunton, and Arbuckle (all of the Mid-Continent), Trenton of the Michigan Basin, Knox and Carboniferous of the Black Warrior Basin, and Frio, Austin Chalk, and Cotton Valley of the Gulf Coast. Masera sold the studies as nonproprietary.

To the benefit of the AAPG membership, Rick once again asserted his leadership skills when he became executive director in August, 1999. In 1999, the petroleum industry was suffering through a long period of depression, and AAPG desperately needed an executive director who could take control and point the headquarters staff in the right direction.

In 2010, Fritz was itching to get back to exploration so he left AAPG and joined SM Energy in Tulsa. While there, he put together numerous new plays all over North America as a member of their new ventures team.

In 2016, SM Energy closed its Tulsa office. Rick wanted to stay in Tulsa so he teamed up with several of his SM colleagues and formed Council Oak Resources. He is its chief executive officer. It is no surprise to us who know Rick Fritz that Council Oak is well on its way to becoming another successful venture for Rick and the people who believe in him.

Edward A. Beaumont

CRETIES D. JENKINS
Distinguished Service Award

Citation—To Creties Jenkins, whose efforts integrating geoscience and engineering through AAPG help us make better decisions about where to invest our efforts and dollars.

Creties Jenkins is a Partner with Rose and Associates, LLP, where he specializes in reservoir appraisal and development. He began his career with Tenneco Oil over 30 years ago working on thermal projects in the San Joaquin and Ventura basins of California as a geological engineer. As the link between exploration geology and reservoir engineering, this position helped define Creties' career niche.

When Tenneco was sold, Creties joined ARCO as a reservoir engineer and played a key role in the design and execution of a large and successful optimized waterflood in the giant Wilmington Field. This was followed by a seven-year stint in ARCO's Reservoir Research and Technical Services (RRTS) Group, conducting reservoir characterization for projects in the United States, China, Russia, Iran, and Indonesia.

While at RRTS, Creties was instrumental in building and leading an annual "Reservoir Architecture of Sandstones" field trip to Utah that served as a focal point for engineers and geoscientists to collaborate on identifying and capturing those heterogeneities that control fluid flow in their reservoir models.

During this period Creties began working coalseam gas, shale, tight sandstone, and tight carbonate reservoirs. Given that all of these could be encountered in a single wellbore, a comprehensive effort was needed to assess the potential of each by collecting, analyzing, and integrating the appropriate static and dynamic data. This led Creties to develop a very popular "Evaluating Resource Plays" course which he has presented over 100 times in the past 15 years.

In 2000, Creties joined DeGolyer and MacNaughton and spent the next 12 years conducting integrated studies, field development planning, resource estimation, peer assists, expert witnessing, and training for many different clients. During this period, he served as a technical editor, distinguished lecturer, and distinguished author for SPE.

It was also during this time that Creties became very involved in AAPG, serving on the organizing committee for the 2004 Dallas ACE and multiple steering committees including a Geotechnology Workshop on "Resources and Reserves Estimation" in 2009 and the Hedberg Shale Gas Research Conference in 2010. Creties also served in various roles for Energy Minerals Division as the 2004 ACE vice-chair, Southwest Section councilor, Tight Gas Sands Committee chair, website chair, vice president, and president (2008-09).

During the past seven years, Creties has served on AAPG's Committee on Resource Evaluation, as an AAPG representative to the URTeC steering committee, and as an AAPG representative to a "Multi-Society Summit on Unconventional Plays" held in 2015. Creties is currently chairing an AAPG co-sponsored multi-society follow-up summit called "Building and Applying the Universal Workflow for Low

Permeability Oil and Gas Reservoirs" to be held in August 2017.

Creties is the author of numerous AAPG and SPE abstracts and papers, and most recently served as a co-author for SPEE *Monograph 4: Estimating Ultimate Recovery of Developed Wells in Low-Permeability Reservoirs*. Creties remains keenly interested in how we evaluate opportunities by integrating data, applying a staged approach, mitigating bias, and employing assurance processes. He is dedicated to sharing this vision through training, consulting, and volunteer work for multiple professional societies, especially AAPG.

Creties graduated with a B.Sc. in geological engineering from the South Dakota School of Mines and was elected to Tau Beta Pi. He followed this with an M.Sc. in geology from the same school. He served for many years on the Advisory Board for the Department of Geology and Geological Engineering, as well as the University Advisory Board. This is where his love of geology began with mapping in the Black Hills and graduate work in the Bighorn Mountains. He is particularly indebted to two mentors and lifelong friends, Dr. Alvis Lisenbee and Dr. Mark Scheihing, for their technical guidance, leadership, and support throughout his career.

Creties' commitment to promoting the science and technology of finding and producing hydrocarbons fits admirably with AAPG's objectives and makes him a worthy recipient of this award.

Gary Citron

KURT NEHER
Distinguished Service Award

Citation—To our fellow explorationist and friend Kurt Neher for the AAPG Distinguished Service Award. For his contributions to AAPG, petroleum geoscience and his visionary leadership.

Kurt is a true leader, stepping forward when needed and stepping back to watch others succeed. He never fails to ask the hard, inquisitive, if not completely out-right challenging questions that drive and push, not only himself, but also his colleagues and teams to succeed. Kurt has an intense interest in marrying traditional geologic techniques, including even fieldwork, with innovative technologies, to create, discover and generate value. He continues to influence our industry and explorationists around the world with his expertise and enthusiasm.

Kurt was born in 1961, in St. Paul, Minnesota, to a large, close-knit family with four sons and one daughter. His parents emphasized hard work, education, sports, and a love of the outdoors, and Kurt's early interest in geology came from collecting fossils from the Ordovician outcrops near the local little league field. He obtained his B.A. degree in geology from Carleton College in Northfield, Minnesota. While at Carleton, he met his wife Luisa, a studio artist, who helped add color and artistic flair not only to his life, but also to his cross sections and maps. After Carleton Kurt spent a year studying mining geology at the Technische Universitaet Clausthal in Germany. There were very few opportunities for mineral explorers at that time, so he came back to the United States and entered an M.S. program at the University of South Carolina focusing on structural geology. His research was centered on the development of the Andean foreland fold and thrust belt in central Argentina. He spent two memorable field seasons mapping the surface and structural geology of the southern Neuquén basin.

In 1986 Kurt went to work for Pecten International, a Shell subsidiary, as an exploration geologist working Latin America. In 1989 he was transferred to the Gulf of Mexico deepwater exploration division in New Orleans. This was an exciting time

as this exploration group was responsible for many of the significant discoveries in the deepwater Gulf of Mexico. Kurt held several positions in the deepwater division, from exploration geologist to lead geologist on a turbidite reservoir research team to eventually leading an exploration group focused on the East Breaks and Garden Banks protraction areas. This team made several significant discoveries that would later be put on production. Kurt had the opportunity to work with many successful and prominent explorers at Shell, and this influenced him greatly. It was a hard decision, but after five years in New Orleans, it was time for a change. In 1994 Kurt left Shell to join Oxy International.

While at Oxy International, Kurt worked many basins and areas worldwide. He initially focused on Southeast Asia and was involved in the mapping and seismic acquisition that led to several large gas discoveries in Bangladesh. Much of this new venture work was done while he lived with his wife and two sons in Brisbane, Australia. Later, the family had the opportunity to live in Quito where he managed a successful exploration program that made several discoveries in the Sub-Andean Oriente basin. Between 1994 and 2006 Kurt held many positions at Oxy International including chief geologist and international exploration manager. Then in 2006, after accepting a transfer to California, he moved his family back to Bakersfield for the third time.

In California, Kurt assembled a small, motivated exploration team that generated a large portfolio of prospects and leads utilizing old data but cutting-edge ideas. California had been long overlooked by explorers, but surely there were more hydrocarbons to be discovered in such a rich petroleum province. Kurt secured funding in 2008 to start acquiring three-dimensional seismic data and drilling exploration wells. By 2014 the team had discovered over 200 million bbl of oil equivalent, and production from these new fields grew in excess of 30,000 boepd. The portfolio of successes included the largest onshore discovery in California in over 40 years. In late 2014 Oxy departed California by spinning off their properties into California Resources Corporation (CRC). Kurt, still profoundly excited about the numerous exploration and development opportunities in California, remained with CRC where he currently is the vice president of business development.

Kurt, a member since 1984, became heavily involved in AAPG upon returning to California from overseas. He has held the positions of president of the San Joaquin Geological Society, Pacific Section Advisory Council representative, technical co-chair, 2014 ACE, and most recently president of the Pacific Section. Kurt currently lives with his wife Luisa in Ojai, California.

Robert Bridges
Bob Stupp

ROBERT N. RYAN, JR.
Distinguished Service Award

Citation—To Robert N. Ryan, Jr., for his many contributions to AAPG through his strong support of membership, student programs and the Corporate Advisory Board.

Robert N. Ryan Jr.'s (Bobby) interest in the energy industry started with fishing trips. Born in New Orleans, fishing around platforms in the bays and offshore waters of Louisiana was part of growing up. Those trips triggered questions to his father, an attorney, as to why the platforms were located where they were and how it was known that oil and gas may be thousands of feet below. Needless to say, the answers were less than satisfactory. His interest continued to grow as a result of two summer jobs as a deckhand on offshore supply boats while a student at Tulane University. The supply vessels delivered logging units, casing, drilling mud and cement, and, of course, there were crews associated with those

goods. The questions continued. Not long after the summer jobs, he switched majors to geology. Little did he know at the time that in just a few short years he would be based on some of those rigs and platforms as a well site geologist.

Bobby is now vice president – global exploration for Chevron Upstream where he is responsible for Chevron's worldwide exploration program. He joined the company through Texaco in 1979 as a geologist in the Offshore Division in New Orleans and has held a variety of technical and management positions in exploration, production and business planning during his 38-year career. Key positions he's held include assistant division manager in the Offshore Division responsible for exploration in the Gulf of Mexico, assistant to the senior vice president, upstream, assistant to the chairman and CEO of Texaco, vice president, Indonesia Business Unit, and general manager, international exploration.

In 1990, through the President's Commission on Executive Exchange in The White House, he was appointed to the Office of the Assistant Secretary for Conservation and Renewable Energy in the US Department of Energy in Washington, DC, where he assisted with utility policy issues related to renewable energy and energy efficiency. He returned to Texaco in 1991.

As the Texaco lead for the Upstream Integration Team for the Chevron and Texaco merger, Bobby played a key role in redesigning Chevron's exploration business. At the merger closing in 2001, he was appointed general manager for international exploration prior to assuming his current position in 2003. He has been a member of Chevron's Management Committee since 2001 and the Upstream Leadership Team since 2003.

Bobby joined AAPG as a student in 1979 and that connection was his first link to professional development. Early in his career, management encouraged participation in professional societies and he carried that message with him as his career progressed. He has been a frequent speaker at AAPG and affiliated conferences around the world, including the All Convention Luncheon in New Orleans in 2010 and the Division of Professional Affairs Luncheon in Long Beach in 2007. He drove investment in AAPG with Chevron being a leader in sponsorship of ACE and other meetings, funding student membership dues, and investment in student programs such as the Imperial Barrel Award. It may be no coincidence that Chevron has the highest number of AAPG members.

In 2006, Bobby joined AAPG's Corporate Advisory Committee and he was elected chairman in 2007. Later that year he drove the development of a new charter and conversion of the committee to the Corporate Advisory Board (CAB) comprised of senior leaders in industry representing much of the AAPG membership. The board plays a key advisory role for AAPG leadership to test new programs and long-term strategies for the society. He was chairman of the CAB until 2014 and remains a member.

He is also vice chairman of the Board of Advisors of the Energy and Geoscience Institute at the University of Utah, and a member of the Board of Advisors at the School of Science and Engineering at Tulane University. He is a former member of the School of Earth Sciences Advisory Board at Stanford University, and the Scientific Advisory Board of CASP affiliated with the Department of Earth Sciences at Cambridge University in the UK.

Bobby and his wife, Michele, have been married for 36 years and have two children and three grandchildren. He holds B.S. and M.S. degrees in geology from Tulane University.

Robert N. Ryan, Jr.

LAWRENCE H. WICKSTROM
Distinguished Service Award

Citation—To Lawrence H. Wickstrom in recognition of over

25 years of service to the AAPG, and a lifetime of scientific dedication to industry, academia and the public.

Larry joined AAPG in 1983, right after grad school, but really became active in it during his presidency of the Ohio Geological Society in 1987-88. His acknowledged service began as chairman of the Membership Committee for Eastern Section (1990-93). He served as general chairman of the Eastern Section Meeting in 1998, where he was also co-awarded the A.I. Levorsen Memorial Award for Best Paper. Larry was elected president of the Eastern Section of AAPG, serving from 1998-99.

Larry championed the idea that the various regional sections needed better representation at the national level, with the dissemination of local expertise to a broader community. His actions, along with others, led to the AAPG Summit on Sections in 2000, which he co-chaired.

During 2000, Larry was awarded the Certificate of Merit and the Distinguished Service Award from the Eastern Section. In 2001, Larry served upon the Advisory Council as the AAPG Eastern Section representative, continuing through 2004. A second A.I. Levorsen Award was presented to Larry in 2001. This year also marked the beginning of Larry's presentations as a visiting geologist, which continues today.

Larry served in the AAPG House of Delegates (HoD) from 1999-2001, and again from 2006-15. He was the chair of the HoD in 2013-14, where he served with distinction during a trying time. As HoD Chair, Larry also served on the AAPG Executive Committee.

In recognition of his efforts, Larry was awarded the Meritorious Contribution to Environmental Geosciences Award (2007), the Division of Environmental Geosciences President's Award (2011), the George V. Cohee Public Service Award (2012) and the Eastern Section's highest honor, the John T. Galey Memorial Award (2014). He has tirelessly acted as organizer, speaker, citationist, field trip instructor, and exhibitor many times.

Larry was born in Santa Monica, California in 1957, to a modest family that eventually settled in Canton, Ohio. He entered Kent State University in 1975, where he soon gravitated to the hops-loving gentry of the geological community. He became the president of the Kent State Geology Club and the KSU chapter of Sigma Gamma Epsilon.

His graduate work focused primarily upon the mapping and geochemistry of volcanics of the Tushar Mountains of Utah. During grad school, Larry also developed a keen interest in computer sciences, becoming involved in computer data and terrain analysis. He graduated with an M.S. degree in 1982.

Larry accepted a staff-geologist position with the Ohio Geological Survey in 1983. He became a member of the Subsurface Geology Group, focusing upon the relationships of hydrocarbons to the strata of Ohio. He initiated the computerized petroleum database and mapping systems for Ohio. He also began to publish the first in over 50 papers upon diverse geologic subjects, which would ultimately lead to his recognition as one of the preeminent geologists in Ohio.

By 1990, Larry was a senior geologist with the Petroleum Geology Group and Division IT Coordinator. He was lead geologist for Class 1 injection wells, writing much of the legislation still utilized today. He worked as project manager for numerous consortia involving both industry and government. Larry was deeply involved with the drilling of key core holes, one of which led to the discovery of the East Continent Rift Basin (ECRB) in 1990. The discovery the ECRB remains one of the seminal discoveries of the Survey.

In 1996, Larry became the supervisor of the Energy Resources Group. In addition to supervising staff, he directed the investigation of oil, gas, coal, CBM and geologic carbon sequestration projects. Larry was also instrumental in the investigation of geologic carbon sequestration in the eastern midcontinent, co-forming and serving as geology director of the nine-state consortium, the Midwest Regional Carbon Sequestration Partnership. During this period, he also directed the creation of the State of Ohio's digital oil and gas well information system. This remarkable accomplishment included the digitization of maps and records for over 220,000 wells.

Larry served as the assistant division chief of the Ohio Geological Survey from 2006 to

2007, and was subsequently named the state geologist and division chief (2007-2012). Larry's research of the Trenton/Point Pleasant Formations was crucial in the development of the Utica Shale Play. His tireless dedication in providing industry and the public with ongoing, unbiased developments and maps underscores the crucial need for individuals of Larry's caliber to serve industry, government, the public, and the AAPG.

Larry has since retired from the Survey, and has begun a new career as a consulting geologist, working with partners to develop hydrocarbon prospects utilizing a geologic understanding of a region that he helped to shape.

T. Joshua Stark

NORMAN J. HYNE
Grover E. Murray Memorial Distinguished Educator Award

Citation—A dedicated and inexhaustible geologist, prolific author and editor, and innovative, engaging educator that has enlightened thousands across the world.

Norm Hyne has been an educator his entire life since college graduation. At The University of Tulsa, he was awarded several teaching awards and was department chairman. He wrote the final Ph.D. accreditation report and was primarily responsible for changing the department from a small undergraduate and part-time M.S. program into a significantly larger, undergraduate and full-time M.S. and Ph.D. program. While in the department, he taught a very popular beginning geology course to thousands of students that resulted in many geology majors. Norm initiated a senior research program and took his graduate students from the jungles of Venezuela to the Straights of Gibraltar to do research.

During the oil boom of the 1970s, Norm developed a very popular, three-day short course, "Basic Petroleum Geology for the Non-Geologists" to teach anyone the fundamentals of upstream petroleum. He has taught this course or a version of it over a thousand times, both public and in-house, to over 35,000 students on 6 continents. It has over 97% excellent evaluations and has never had an unsatisfactory evaluation. Norm is still teaching it today. He was the first professor to teach short courses through The University of Tulsa Physical Science and Engineering College Continuing Education Department and was instrumental in developing it into its present status as a world leader in petroleum continuing education. He also taught advanced short courses in seismic stratigraphy, reservoir rock geology and reservoir characterization for AAPG, SEG, SPE and several oil companies. Several hundred students have also taken his University of Tulsa Petroleum Exploration and Production online course and seen his training video produced by Phillips Petroleum. He has recorded a podcast, *Seismic Soundings*, for SEG.

Norm has lead over 200 Tulsa area geology field trips for organizations ranging from Boy Scouts to AAPG Mid-Continent section meetings and the International Improved Oil Recovery Conference.

He is the author of six petroleum books and the editor of four petroleum books. His book *Nontechnical Guide to Petroleum Geology, Exploration, Drilling and Production* was written to introduce anyone to the upstream petroleum industry and has sold 55,000 copies. His *Dictionary of Petroleum Exploration, Drilling and Production* is the most complete upstream petroleum dictionary ever published with listings of 19,500 definitions, 11,700 abbreviations and 447 geological societies. The books he edited for the Tulsa Geological Society, (1) *Pennsylvanian Sandstones of the Mid-Continent*, (2) *Limestones of the Mid-Continent*, (3) *Petroleum Geology of the Mid-Continent* (coeditor), and (4) *Sequence Stratigraphy of the Mid-Continent*, are commonly used by geologists

exploring the Mid-Continent. Norm wrote the introductory chapters for three of these books.

He is the senior author of research papers published in the *AAPG Bulletin*, *GSA Bulletin*, *Journal of Geology*, *Journal of the Society of Economic Mineralogists and Paleontologists*, *Environmental Geology*, *Marine Geology*, *Shale Shaker*, *Oil Industry History* and Tulsa's *Physical Environment*. Norman has also published on the legal aspects of petroleum exploration and production in several law journals.

Norm served several terms as a planning commissioner and vice-chairman for the Tulsa Metropolitan Area Planning Commission. He was a member of the committee that drafted the present City of Tulsa master development plan and helped draft and get adopted Tulsa's present flood plain zoning restrictions.

Norm has been a member of the AAPG House of Delegates for some time. He was the general chairman for a GSA Mid-Continent meeting and has been on the field trip and short course committees for several AAPG Mid-Continent meetings. Norm has been a board member of the SPE Improved Oil Recovery Conference since its beginning. He is a fifty-year honorary member of AAPG, a Certified Petroleum Geologist, AAPG Foundation member, fifty-year honorary member of the GSA and an emeritus member of the Tulsa Geological Society. He was a technical editor for the *Glossary of Geology* and an editor for both the Tulsa Geological Society and the Geophysical Society of Tulsa.

Norm has presented very popular talks to the public on his favorite subjects, the discovery of the Glenn Pool Oil Field and Tulsa, the Oil Capital of the World over 150 times. In his younger days, he enjoyed long-distance trekking and mountain climbing. He is the only member of The Explorers Club in the state of Oklahoma.

During the financial crisis of 2009, the SEG headquarters in Tulsa abandoned a geoscience education program for local schools. Norm took over as executive director of the Tulsa Geoscience Center, appointed a new board and found a new location. It offers field trips for school classes, primarily K-6 grades, to learn about rock and minerals, fossils, dinosaurs, earthquakes, tsunamis, radioactivity, fluorescence and petroleum. The center is run with these principles: It has to be fun, hands-on, and educational. Students assemble their own rock, mineral, and fossil kit to take home. Since Norm took over directing the center, school visits have tripled to 5,500 students last year. It is the only Tulsa area facility that trains Boy and Girl Scouts for geology merit badges (over 1,000 have been awarded) and is the only Oklahoma Energy Resources Board accredited field trip site in Tulsa. The center can be seen in detail at www.tulsageosciencecenter.org.

Norman plans to put an energy exposition in Tulsa to educate the public. He formed Energy America, a nonprofit corporation, for this purpose and is the director. Architectural plans have been drawn and funds are currently being raised. The city of Tulsa is supporting this idea by offering an existing location for this purpose.

James S. McGhay

Response

I am very pleased and very honored to receive the Grover Murray Distinguished Educator Award. Grover Murray was a credit to our profession not only as a teacher but also as a researcher and administrator. Like me, Grover continued to teach geology after his retirement. You can't stop us. I also suspect that Grover had several mentors who inspired him when he was young. I had several. I can remember a grade school science teacher and a high school calculus teacher but I cannot remember their names. At Pomona College, it was Donald McIntyre and A.O. Woodford. Woody had already retired but I still remember as a freshman scrambling up the sides of Crestmore Quarry trying to keep up with him even though he was more than 50 years older than me. At Florida State University, it was Grant Goodell, my advisor, and Bill Tanner who lead great field trips. My dissertation at the University of Southern California was done under Donn Gorsline who had a great sense of humor. We had a great time as I worked on the geological origin of Lake Tahoe. I was one of the first to ever use an air gun seismic source and

hauled an oceanographic piston corer up to the lake. The research that resulted is still the baseline for any geological research done Lake Tahoe.

Teaching is something you should not do unless you love it. Unfortunately a lot of people teach who shouldn't. Students voted for me as the outstanding teacher my first year at The University of Tulsa. The dean, who was one of the worst rated, explained to me that it was because I was an easy grader. Enrollment in my beginning geology classes increased tenfold by the second year and future enrollments had to be limited by room size. The reward for teaching is from your former students, and I have had almost forty thousand, that you run into decades later. You can't remember their names, but they remember you. Being paid (but not much) for your teaching also helps a little.

My first interest in geology occurred when I was a young boy growing up in suburban Chicago and a reclusive uncle died in Arizona. My family, his only remaining relatives, traveled to Arizona to sort out his meager possessions. He left something I will never forget, a rock with a vein of gold going through it. I was convinced he had rediscovered the Lost Dutchman's gold mine in the Superstition Mountains. There were no geologists where I lived and no geology courses to take. It was not until much later that I realized it was fool's gold. It was also during that time our school went on a field trip to the Chicago Field Museum of Natural History. There was a new exhibit of beautiful Mazon Creek fern fossils that they had just collected. They made the mistake of showing a map of exactly where they had found them. I went there as soon as possible and started a museum-quality collection of fern fossils. I still have the fool's gold rock and the Mazon Creek fossils plus a lot more things that now fill my home.

Geology is a very visual science. I love going on field trips and my students love the slides (now PowerPoint) that I show in all my classes. Many of my beginning geology students had never been out of Oklahoma but I took them throughout the world. I lived and taught during a time of rapidly developing technology. I used to print the class notes for my students on a mimeograph machine. When I got my first Apple computer in 1977 I remember asking if 256 K was too much memory. The computer allowed me to edit my class handouts without liquid whiteout. I used to finish my lecture on oil and gas measurements with the question "there are only three nations today that still use the old English system of measurements - yards, pounds, gallons. The United States is one - name the other two." I stumped every class until 2007 when a young lady in the back row almost immediately shouted out Liberia and Myanmar. I was stunned and my first thought was that she had taken my course before. Then the student next to her shouted out that she had used her iPhone. I called up my grandchildren that night and asked the same question. They had the answer within 10 seconds from Siri. I got an iPhone the next day.

During the oil boom days of the late 1970s, I developed a three-day short course, "Basic Petroleum Geology for the Non-Geologist." It was designed for people being hired by the rapidly expanding oil companies. The faculty advisor for Continuing Education recommended that it be rejected because it was not an advanced course. Fortunately I gave it a try and it instantly became the most successful course the university has ever had. They sent me throughout the world to teach it on six continents, everywhere there were oil or oil companies. I have had tens of thousands of students. I teach the course with a continuous PowerPoint show and never have had a complaint from anyone who got lost or bored. I have since written a textbook that follows my short course but with more information. I give the book out with my short course and the students love it. Days or even years later, they can look up what I said. Each student in my class also receives their own rock and mineral kit for a hands-on experience. They are often surprised when they take it home and their kids are able to identify everything in the kit because rocks are now taught in grade school. Times have changed.

Receiving this award is certainly the high point of my lifelong career of doing what I have loved to do, teach geosciences. My sincere thanks to everyone who made this award possible.

Norman J. Hyne

CARI L. JOHNSON
Grover E. Murray Memorial Distinguished Educator Award

Citation—For her unwavering commitments: Mother, Teacher, Mentor, Researcher, and Friend. Pursued always with a vulnerable excellence that inspires more.

You may have heard it said "You can take the girl out of Texas, but you can't take Texas out of the girl." I'm not certain that statement applies to Dr. Cari Johnson, but she was born and raised in Austin and later Tyler, Texas, and only had her first experience of camping after moving to Salt Lake City, Utah in her teens. Cari's early outdoor adventures are legend. For a field-based researcher, the connection to nature is both innate and intimate. Her exposure to spelunking and backpacking sparked a keen interest in natural sciences that led her to matriculate at Carleton College, with the life ambition of becoming a globe-traveling nature writer.

It was during an intro course on geology that Cari found herself on a week-long field trip to northern Minnesota led by Dr. David Bice, with a couple of teaching assistants and small cohort of students. Upon her return, she was hooked. Through the KECK program, Cari found herself in Cyprus studying ophiolites, and spent a semester abroad in Italy after that. The passion of her mentors at Carleton and several outstanding field-based opportunities, led her to pursue a Ph.D.

"Go West" is the spiritual admonition for all who yearn for open space. After a brief stop-over at Stanford University (presumably to enroll under the direction of Dr. Stephan Graham), Cari continued westward and found herself field assisting for Brad Ritts and Andrew Hanson in the Tarim Basin of northwest China. Cari returned to Stanford with a deep passion for Asian geology. Her field-based dissertation was a multidisciplinary study of Mongolian rift systems and implications for petroleum system development, with publications spanning the sedimentation and tectonic evolution of the East Gobi Basin, to a geochemical study of oil typing and non-marine source rock characterization.

Much could be said about Cari's time in Asia (12 trips as of this biography): pioneering innovations in field methods (related to the appropriate temperature regulation of preferred beverages), significant contributions at a system level to the understanding of the province, and a rich sociological perspective framed by a temporary detainment in the company of local authorities.

While at Stanford, Cari interned with Chevron and Texaco, and made the questionable decision to pursue a post-doc with the US Geological Survey focusing on sequence stratigraphy and petroleum potential of the San Joaquin Basin (let the record show, the biographer is a Chevron employee).

Cari moved back to Salt Lake City and joined the faculty of the University of Utah in 2003 following her post-doc. Cari's research interests at Utah have expanded beyond Mongolia to include a significant effort on depositional systems in Cretaceous strata of the Kaiparowits Plateau (southern Utah), fluvial-deltaic systems in central Utah, and geochemistry and sequence stratigraphy of the Maikop Series in Azerbaijan.

Much of Cari's recent work has been focused on using outcrops as analogs for petroleum systems and incorporating LIDAR and petroleum systems modeling software to advance multi-scale predictive methods of reservoir architecture in collaboration with Dr. Lisa Stright at Colorado State University.

Cari has been awarded multiple times at the department and university level for excellence in teaching and mentoring. She's served as the faculty advisor for the AAPG Student Chapter since 2003. Cari's leadership was instrumental in developing the Petroleum Industries Career Path course program, an integrated suite of courses and field-based activities that provide students broad exposure to the petroleum

industry. Her CV is overwhelming in accomplishment for such a young researcher. She's served on the University's Presidential Commission on the Status of Women, the editorial board for *Geology*, and *Basin Research*, and was elected a GSA Fellow in 2016. She is well published, and well awarded with grants and funding.

As an educator, Cari's most significant contributions will continue to be evidenced in and through the community of students she mentors. Her principle gift has been to train students in how to think, privileging their own scientific inquiry and maturation over a more prescriptive approach. Cari has created an integrated community of student-academics who challenge and shape each other's pursuits as field assistants and collaborators on multi-disciplinary efforts. A remarkable aspect of Cari's cohort is the camaraderie they exhibit. Several of her students were on a multi-year winning intramural dodgeball team (the Nodding Donkeys). There's a shared life on the part of the students, and Cari's own life lived out before them. Cari is a mother to two young girls and one Portuguese Water Dog, and is a strong advocate for the dual vocation of mother and scientist. In her spare time, Cari has taken up tennis with the same vigor and energy she exhibits in her other pursuits—which is to say, with intensity and commitment. Cari also enjoys biking, beer, and generally being awesome.

Training students to be scientists is one thing, training them to excel at being present and human is another. It takes real courage to participate fully in the life-mentoring Cari provides to her students and colleagues, and she is fiercely proud of them. As one who has benefitted richly from her mentorship, I'm honored to offer this portrait, and conclude with the words of Tennyson's Ulysses:

> Yet all experience is an arch wherethro' gleams that untravell'd world
> whose margin fades for ever and forever when I move.
> How dull it is to pause, to make an end, to rust unburnish'd, not to shine in use!
> As tho' to breathe were life! Life piled on life were all too little,
> and of one to me little remains: but every hour is saved from that eternal silence,
> something more, a bringer of new things;
> and vile it were for some three suns to store and hoard myself, and this gray spirit yearning in desire to follow knowledge like a sinking star, beyond the utmost bound of human thought.

To what lies ahead,

Jake Umbriaco

Response

Many thanks to the AAPG Foundation and to Dr. and Mrs. Murray for providing this award. Thanks to my nominators and especially to Jake Umbriaco for crafting such a splendid citation. I'm not crying, you're crying! (Thank you also for selectively omitting or otherwise obfuscating certain other details you certainly could have included. The next taco is on me.) While we're on the subject of Tennyson: "Knowledge comes, but wisdom lingers."

For someone in the publish or perish business who is not often at a loss for words, I find myself in the somewhat unusual position of not knowing quite what to say. I don't know how much credit I can take for any of this. I know most of my peers would agree that we have the best job, made all the better due to supportive and dedicated colleagues and students. I'm mindful of how very fortunate I am to even be in a position to win such an award: how easily I could have wandered another direction, if not for the incredible geoscience faculty at Carleton and Stanford. I learned from and with the best. Thank you to Steve Graham for your intellectual leadership, mentorship, friendship, and guidance, and for modeling the advisee-cohort approach: despite brief phases of dysfunctionality, I can't imagine doing what I do without support from "the family."

I suppose there has been some hard work along the way, but there's also been plenty of privilege and plain old luck. It seems especially important to remember that now, as we struggle to improve diversity in STEM fields and earth science in particular. I've felt an increasing weight of responsibility as a science educator lately, so aware of public (mis)perceptions and the politicization of science. The students we are educating now will face, along with us, daunting challenges in the Energy and Sustainability arena. I am immensely proud to be part of a college that includes a strong

petroleum and energy geoscience program (if I may say so), as well as some of the best climate and environmental scientists around. We owe it to our students, not to mention the planet, to provide the best preparation possible in the face of such challenges. I believe the key still lies in the fundamentals: field and observational skills, quantitative literacy, multi-disciplinary toolkits, critical thinking, and communication. In addition, we must continue to rise by lifting others. Thank you for this turn on the lift. I commend AAPG for being an industry-focused, "applied science" association that values the importance of education and training.

With gratitude,

Cari Johnson

JULIA GARDNER
(posthumously)
Harrison Schmitt Award

Citation—Julia Anna Gardner was a remarkable and avid explorer, a brave warrior, and deeply humane human being whose expertise in multiple areas was profoundly utilized.

Julia Anna Gardner was a remarkable woman not only as an avid scientist, doing geologic field work on her own along the US Atlantic Coast, Gulf Coast, Texas interior, and in Mexico but also for active participation in World War I and World War II.

Gardner spent her early years in South Dakota where her father died when she was 10 years old. At age 16 she moved with her mother to Massachusetts where she attended and graduated from the prestigious Drury Academy. She wisely chose to attend Bryn Mawr College and studied under the legendary Frances Bascom and achieved both her bachelor's and master's degrees by 1907. She went to Johns Hopkins University for her Ph.D. (1911). She was the first woman "regularly" admitted to the Department of Geology for her Ph.D. as Bascom's admission was "conditional" including the stipulation that she sit in a corner behind a screen so as not to disturb the men! Gardner continued her coastal biostratigraphic studies with molluscan fauna after her degree employed by the precursors to the US Geological Survey (USGS).

Dedicated as she was to her geology, at the onset of World War I, she was horrified by the terrible waste of life, the destruction that seemed to her so useless. She was willing to make a personal sacrifice to help alleviate the suffering of people who were caught up in this European disaster. Following her heart, in 1917, at age 32, she joined the Red Cross and was in France before the end of the year. At first, she worked with the American Canteen Service and later as an auxiliary nurse with the ambulance service and in the hospitals. Gardner's diaries for that period were destroyed after her death, unfortunately, but we know that she was on or near the front lines in France and was decorated by the French Government for her service with distinction and valor. The front line was a particularly horrifying place to be during World War I, with death in the millions from gas, bullets, shrapnel, gangrene, freezing, even from sinking irretrievably into mud and muck—forcing compassionate compatriots to shoot men who could not be rescued. She was wounded there, but stayed on in Rheims after the war to help with recovery.

Gardner returned to the USGS after the war and resumed her studies of the Coastal Plain Tertiary beds rocks extending her reach into Virginia, North Carolina, and on down the coast to Florida. She then forged her way westward to the Mississippi Embayment and thence westward into Texas, following her science and studying it with thoroughness. She worked out the stratigraphy and the correlations of the Midway [Formation], both in this country and abroad. Gardner's work took her across the Rio Grande Embayment into Mexico, where she could correlate the Tertiary faunas of northern Mexico with other Gulf Coast faunas.

"In the field, she usually traveled alone. If there were no hotel accommodations she stayed at the nearest farmhouse, and more than once when she was out in the boondocks at nightfall she slept in her car, which she drove with more daring than skill, although she always seemed to get through. She seemed to be almost without the sense of fear" (Sayre, 1961).

Gardner was a key biostratigrapher for the oil and gas business from 1920 up to World War II (1941). Petroleum geologists were in a desperate situation trying to work out the chaotic Gulf Coast stratigraphy—without the benefit of yet to be discovered micropaleontology geophysical logs, and seismic. She became a valued contributor through her association with Sidney Powers, who, in 1920 sent samples to Gardner asking for help. Powers, happy with her work, recommended her to a great number of geologists for help with biostratigraphy. The relationships he cultivated lasted well beyond his shortened life (he died in 1932). Powers addressed her as "My Dear Miss Gardner" and arranged for her to meet oil company geologists in the field or join them on a field trip. Gardner's correspondence (preserved at the Smithsonian) indicates that she worked with over 60 companies and more than 20 consultants. In the 1930s she was also mapping for and working on the geologic map of Texas.

With World War II, Gardner joined the Military Geology Unit of the USGS where she used geology for planning, establishing, and maintaining beachheads putting in long hours and was always ready to lend a helping hand to her younger coworkers. Her maps were beautifully prepared, her texts superior. Incredibly, Gardner used her paleontological skills and pinpointed specific beaches in Japan from where balloon-borne incendiary bombs were targeting the Pacific Northwest. After the war, at age 53, she went for a tour of duty in Japan and worked with their geologists and biologists.

In addition to her USGS professional papers and the GSA's Memoir 11, *Mollusca of the Tertiary Formations of Northeastern Mexico*, she published more than 40 other papers and more than 30 were without any co-authors.

Gardner, age 45, joined AAPG in 1927, three years after she started working with oil and gas companies and maintained her membership for 33 years until her death. She was the recipient of countless awards, was a charter member of SEPM, a Fellow of Geological Society of America (GSA), and vice president of GSA, a Fellow with AAAS, and received the US Department of the Interior's Distinguished Service Award.

Julia Anna Gardner, was no "ivory-tower" scientist, although her standards were high and exacting. She achieved a remarkable balance between her work and her social life and often entertained scientists, writers, painters, teachers, businessmen—and her parties were always delightful. Her views on professional and personal behavior and on political matters were strong and firm, and she expressed them well and generally wittily. If the situation demanded, she could criticize concisely and succinctly, but never unkindly. (Some materials from Henry S. Ladd AAPG Memorial, 1962 and A. Nelson Sayre GSA memorial, 1961).

Robbie Gries

ZHONGJIAN QIU
Harrison Schmitt Award

Citation—For pioneering work leading to numerous major oil and gas discoveries and outstanding leadership in petroleum exploration in China for over six decades.

Zhongjian Qiu was born to an intellectual family in Nanjing, Jiangsu Province, eastern China in May 1933. He was raised in Nanjing (1933-37) and Chongqing (1937-53) and

graduated from Chongqing University majoring in petroleum geology in 1953.

Zhongjian Qiu began his professional career as a field geologist surveying the northern Qilianshan Mountains and the Ordos Basin in western China from 1953 to 1956, and the Songliao Basin in northeastern China from 1957 to 1964. He then worked as a research geologist and took up various senior research and managerial roles during the petroleum expedition and exploration in the Bohai Bay Basin, Sichuan Basin, South China Sea basins and Tarim Basin. Zhongjian Qiu was one of the pioneers in the investigation of the Songliao Basin in 1957 and made a significant contribution to the discovery of the renowned Daqing Oilfield. His work was instrumental in leading to the discovery and evaluating the high-productive Shengtuo Oilfield in the Bohai Bay Basin in 1964. Zhongjian Qiu also participated in the petroleum exploration in the Sichuan Basin in 1965, contributed to several major gas discoveries, and the initial evaluation of the giant Weiyuan gas field.

During 1979 to 1987, as the chief geologist of China National Offshore Oil Corporation, Zhongjian Qiu organized and engaged in the international cooperation of the Chinese offshore oil industry in exploring and evaluating the Pearl River Mouth Basin in the South China Sea and the Liaodong Gulf Basin in the Bohai Bay. His leadership and dedicated work contributed to the discoveries of the Liuhua, Huizhou, Suizhong, and Jinzhou offshore oil and gas fields.

From 1989 to 1999, Zhongjian Qiu was the commander-in-chief for the Tarim Basin Petroleum Expedition. His innovative exploration planning and workflow design under very challenging geological conditions led to a number of major discoveries including the renowned Tazhong and Yaha petroleum provinces, and the giant Kela-2 Gasfield, which provides the major gas supply for the China's first West-East Gas Pipeline project. In 1987 Zhongjian Qiu was promoted to exploration manager and deputy chief geologist of China National Petroleum Corporation (CNPC) and then, in 1990, to the position of vice president of CNPC (1990-96) overseeing exploration and research and technology development. He also served as president of CNPC's Research Institute of Petroleum Exploration and Development (RIPED) between 1993 and 1996, during which he started some major research and development initiatives including the setup of the Laboratory Center for Petroleum Geoscience Research in RIPED. In 1999 Zhongjian Qiu was elected as a Fellow of Chinese Academy of Engineering (CAE) and as the president of the Chinese Petroleum Society (1999-2003). Since 1999 Zhongjian Qiu has been working in the CNPC Consultation Center initially as director of the center (1999-2003) and then as a senior advisor (2004-present), providing advice on strategic petroleum exploration for CNPC. As a Fellow of CAE, Zhongjian Qiu also provides regular advice to the Chinese government on her petroleum industry and energy policies. Zhongjian Qiu is a founding member of Chinese Petroleum Society and an active member of AAPG.

Over a span of 60 years, Zhongjian Qiu made sustained contributions to the Chinese petroleum industry and is a well-known pioneer in petroleum exploration in China. His unfailing contribution was instrumental to many discoveries including those of the Daqing Oilfield, the Shengli Oilfield, and the South China Sea basins, the Sichuan Basin, and the Tarim Basin petroleum provinces. His great contribution to petroleum exploration lies in that some of his conceptual models built on careful geological investigations were pioneering and led to many major oil and gas discoveries. His outstanding leadership in petroleum exploration is seen from his innovative approach in solving petroleum exploration challenges, effective program implementation, adoption of new technologies, and

developing international cooperation.

Zhongjian Qiu's contribution to the petroleum exploration and the Chinese petroleum industry has been well recognized in China. He was awarded a State Natural Science Award (first prize) in 1982 for his contribution in the discovery of the Daqing Oilfield; an Outstanding Prize of the State Science and Technology Advancement Award in 1985 for his great contribution in the discovery of the Bohai Bay oil fields; a Second Prize of the State Science and Technology Advancement Award in 1988 for his work in the offshore Liaodong Bay discovery; and a First Prize of the State Science and Technology Advancement Award in 2001 for his leadership in the discovery of the giant Kela-2 gas field. Zhongjian Qiu was also elected as a member of Chinese People's Political Consultative Conference between 1998 and 2003.

In recognizing his pioneering exploration work, outstanding leadership and sustained contribution to petroleum exploration in China for over six decades, it is quite appropriate to honor Zhongjian Qiu with the Harrison Schmitt Award. This will certainly inspire many petroleum explorationists to follow the footsteps of Zhongjian Qiu to dedicate their lifelong service to petroleum exploration and to make an impact to the future petroleum industry.

Keyu Liu

FRIENDS OF DINOSAUR RIDGE
Public Service Award

Citation—To the Friends of Dinosaur Ridge in appreciation for protecting a valuable geologic and historic resource and for promoting earth science in the Denver, Colorado area.

The Friends of Dinosaur Ridge (FODR) has become the preeminent outdoor laboratory for teaching the young and old alike about the geologic history of the Denver area. The mission of this 501(c)3 non-profit organization is to preserve the paleontologic, geologic, and historic resources at Dinosaur Ridge, Triceratops Trail, and outlier fossil sites in the Golden-Morrison Fossil Area National Natural Landmark and to educate the public about these resources.

The flanks of the Dakota hogback, located on the west side of what is now the Denver metro area, has long-been known as one of the world's most famous fossil localities beginning in 1877 when the first *Apatosaurus*, *Stegosaurus* and *Allosaurus* specimens were discovered in the Morrison Formation by Arthur Lakes. When a road was constructed over the ridge in 1937, extensive dinosaur trackways were uncovered in the Dakota Group on the other side of the ridge from the bone sites.

The seed for forming this 501(c) 3 non-profit organization arose in 1988 when Martin Lockley at the University of Colorado Denver wrote a letter to the Colorado Department of Transportation (CDOT). The letter asked the department if there was any way to stop the pilfering of dinosaur tracks from alongside Alameda Parkway as it traversed part of the Dakota hogback, now called Dinosaur Ridge. Fortunately, that letter landed on the desk of Joe Tempel who convinced his associates at CDOT to erect a fence to protect the track site. Soon after acting on the letter, Tempel became a volunteer and then, after retiring from CDOT 10 years later, executive director of the Friends of Dinosaur Ridge (FODR).

The organization incorporated in 1989 and has been quite successful in fulfilling its mission of preservation and education. This, in no small part, was accomplished with the support and help of a dedicated group of volunteers, including many AAPG members. Through funding from individuals and government entities, such as the Scientific and Cultural Facilities District, Jefferson County Open Space and Great

Outdoors Colorado, the FODR over the last 25 years has expanded its facilities to include a gift shop, a visitor center and a newly acquired teaching center. Money was also raised and used for the preservation of and access to the track and bone sites on the ridge and at Triceratops Trail fossil site in Fossil Trace Golf Course in Golden, Colorado. Additionally, philanthropic foundations like the RMAG Foundation, RMS-AAPG Foundation and AAPG Foundation have provided funds for publications and for the tools needed for outreach and teaching. In addition to the thousands of school children and other visitors who have toured the ridge, resources provided by FODR have been used by the AAPG in its teacher education programs that accompanied the 2001, 2009, and 2015 Annual Convention and Exposition.

In 1973, prior to the establishment of Friends of Dinosaur Ridge, this part of the Dakota hogback was officially designated as the Morrison Fossil Area National Natural Landmark by the National Park Service. In 2001, the State of Colorado recognized the area as a State Natural Area. The Colorado Geological Survey designated both Dinosaur Ridge and Triceratops Trail as Points of Geological Interest in 2006 and in 2009 *USA Today* labeled the Ridge as the outstanding free vacation venue in Colorado. In recognition of its importance to the community, the Rocky Mountain Association of Geologists awarded the FODR the 2015 Public Service Award. As a result of the hard work and dedication of FODR volunteers, Dinosaur Ridge is now widely recognized as a great place to view and learn about the great outdoors and its animals, both past and present, through its publications, programs, science camps, tours, and field trips all centered on this once-imperiled natural wonder.

C. Elmo Brown

W. LYNN WATNEY
Public Service Award

Citation—To W. Lynn Watney in recognition of a career in dedicated public service to academia in research and student mentoring, industry for application-oriented geology, and the general public for education in major geoscience issues throughout Kansas and the Midwest.

W. Lynn Watney was born in Mason City, Iowa in1948, and attended school in Northwood, Iowa. As a boy, he developed an early interest in rocks, landforms, and meteorology. While he maintained an active interest in weather and cloudscapes for the rest of his life, it was his passion for geology that determined both his choice of college major and subsequently, his lifelong career. Lynn went to Iowa State University where he graduated with distinction with a B.S. in geology in 1970. During that year, he also married his wife, Karen, from Northwood, Iowa and they have a daughter, Chris, who currently resides in Denver. In the summer of 1970, he worked as a petroleum geologist for Gulf Oil Corporation in Jackson, Mississippi, followed by work for Chevron Oil in the summer of 1971 in Lafayette, Louisiana.

Following graduation with a master's degree from Iowa State University, Lynn was employed by Chevron as a development and exploration geologist at its New Orleans office. He worked as a well site geologist on tests in North Carolina, Florida, Arkansas, Kentucky, Alabama, and Louisiana. In 1976, he joined the Kansas Geological Survey in Lawrence and started work on the Pennsylvanian Lansing-Kansas City groups in subsurface Kansas, which became the basis for his monumental Ph.D. dissertation at the University of Kansas. He rapidly extended his research into the entire stratigraphic column of Kansas and became a master practitioner in integrating outcrop, core, and petrophysical logs in studies that advanced geological science, while addressing applied problems and their solutions. Starting in the 1970s with the university mainframe computer, Lynn pioneered computer

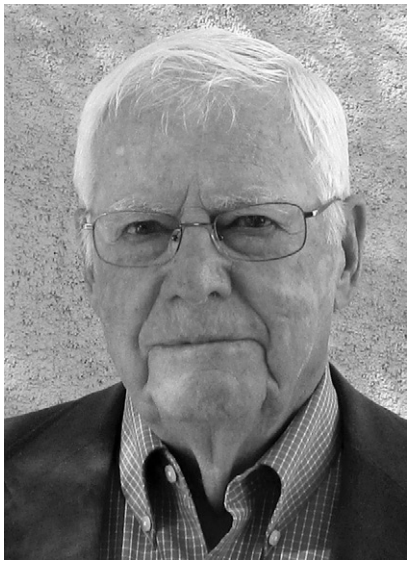
applications in geology that he continues to this day with JAVA implementations on the web. Early work on stratigraphic analysis evolved into sedimentary modeling and reservoir characterization. In addition to documenting his research in publications, he has worked tirelessly as a convener of workshops, field trip leader, short course instructor, and service as officer and committee member for technical societies, including AAPG and SEPM at national and regional levels. Highlights among his many awards are a Distinguished Achievement Citation from his alma mater of Iowa State University and the Robey H. Clark Award for service to the AAPG Mid-Continent Section.

Although Lynn is widely recognized as an authority on the geology of Kansas and the Midwest, he has gained geological experience on an international stage. On his first trip outside the United States in 1982, he spent five weeks in Bangladesh, where he was a geological consultant to the Bangladesh Energy Project funded by USAID. When mainland China opened for scholarly exchanges in the 1980s, several Chinese geologists came to Kansas for collaborative work with Lynn. He visited the Daqing Petroleum Institute, Heilongjiang Province, China in 1985, where he conducted a lecture series on sedimentary basin analysis. Since that time, Lynn has collaborated with many geologists from foreign institutions and traveled to institutes in East Germany and South America.

In his career at the Survey, he has held a wide variety of positions, starting as a research associate, before taking leadership positions as chief of the Subsurface Geology Section, chief of the Geologic Investigations Section, and chief of the Petroleum Research Section. From 1991 until 2007, he was executive director of The University of Kansas Energy Research Center. Throughout this time, his projects encompassed a range of topics within the stratigraphy and regional geology of Kansas, with a primary focus on oil and gas reservoirs. Lynn always has his door open for students and has mentored numerous geologists and petroleum engineers over the years. As a courtesy professor of geology at both The University of Kansas and Kansas State University he has also served on many graduate committees. During his career at the Kansas Geological Survey he has been the author or co-author of 52 articles and hundreds of unpublished abstracts. In 2010, he was president of the Kansas Geological Society. Most recently, he has led a major Department of Energy-funded project of carbon storage in southern Kansas, coupling enhanced oil recovery in the Mississippian with sequestration in the Arbuckle saline aquifer system.

As now a senior scientific fellow at the Kansas Geological Survey, Lynn Watney has always been acutely aware of the service function of his work to multiple constituencies of university, industry, and the general public. The extensive publicity surrounding the dramatic gas leaks at Hutchinson spurred recognition of his role as an important member of the team that moved expeditiously to evaluate the situation and initiate remediation. However, this is only one highlight of an entire career of over 40 years of tireless public service to the people of Kansas and the geological science community of the World.

John Doveton



JOHN W. OTY
Pioneer Award

Citation—For long and valued service to AAPG and affiliated geological societies, contributions to the geological sciences, and inspirational leadership in hydrocarbon exploration.

A native of North Dakota, John Oty graduated in 1955 from the University of North Dakota (B.S.). He went immediately into the US Air Force and served as a jet fighter pilot in Europe during the Cold War. In 1958, he joined Mobil Oil Corporation as an exploration geologist in Casper, Wyoming. John soon was enticed to join J. M. Huber Corporation in Denver.

Rising to successively higher managerial positions, he worked for Anadarko Production Company, Maxus Energy Company, and McMoRan Exploration Company in Denver, Houston and Amarillo. John's ability to lead and inspire geologists working on his teams is legendary. He was chief geologist and regional exploration manager at Anadarko, and exploration manager at Maxus. He became senior vice president of exploration and production and a member of the Board of Directors for Midlands Energy Company.

In 1990, John became an independent geologist and returned to Denver. His insightful analysis and rigorous attention to detail was of critical importance to the success of several ventures that we undertook together in Colorado, Montana, and North Dakota.

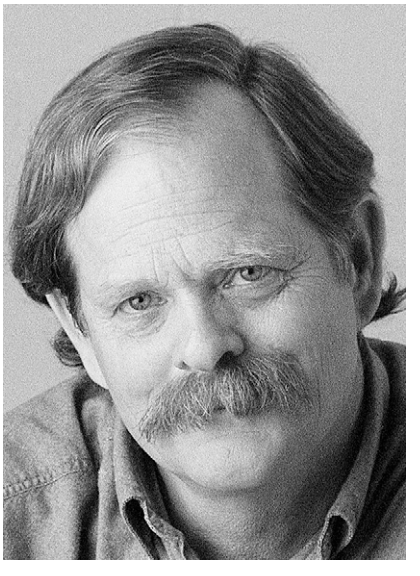
He has served the Rocky Mountain Association of Geologists (RMAG) as president (1998), president-elect (1997), counselor (1992-93), first vice president (1977), treasurer (1975), and managing editor of *The Mountain Geologist* (1972-74). He is an Honorary Member of RMAG. Recently, he was a contributing author for RMAG's *Oil and Gas Fields of Colorado-2014*.

AAPG has benefited from John's membership over a period of 58 years. He has been a member of AAPG's Division of Professional Affairs Board of Certification (1994-97), a member of the House of Delegates Committee (1986-87), a council member of the Division of Professional Affairs (1984-87), and a member of the Education Committee (1978-82).

John is also a past president of the Panhandle Geological Society and has been a member of the Oklahoma City Geological Society and the Arizona Geological Society. In honor of his parents, John established the Oty Family Endowment in 2000 to award grants to students at the University of North Dakota. He currently resides in Green Valley, Arizona, where he is partially retired. Among other activities, John helps to teach at the local Computer Club.

Because of John Oty's long history of meaningful and significant contributions to our profession, and his inspirational leadership in hydrocarbon exploration, he richly deserves the Pioneer Award.

Dudley W. Bolyard



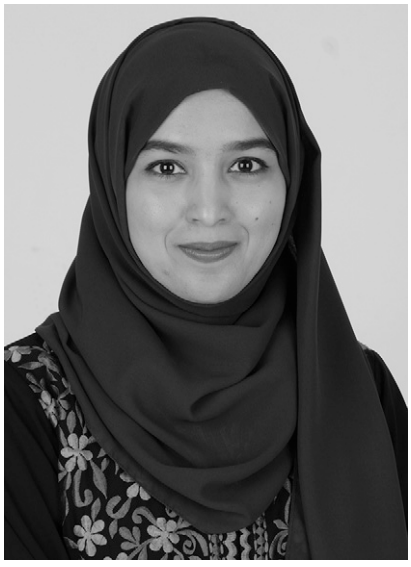
MICHAEL COLLIER

Geosciences in the Media Award

Michael Collier rowed boat for a living in Grand Canyon in the late 1970s and early 1980s; he now lives and practices family medicine in Flagstaff. Collier has published books about the geology of Grand Canyon, Death Valley, Denali, and Capitol Reef National Parks. He has written and photographed books on the Colorado River basin, glaciers of Alaska, climate change in Alaska, and recently completed a three-book series on American mountains, rivers, and coastlines. As a special projects writer with the US Geological Survey (USGS), he produced books about the San Andreas Fault, downstream effects of dams, and climate change. Collier has created an iPad app about seeing landscapes from the air, written a number of book forewords, and has produced video field trips for geology and geography textbooks.

Collier received the USGS Shoemaker Communication Award in 1997, the National Park Service Director's Award in 2000, and the American Geological Institute's Public Contribution to Geosciences Award in 2005. His aerial books on mountains, rivers and coastlines won Outstanding Science Trade Book awards from the National Science Teachers Association in 2007, 2008, and 2009.

Collier received a B.S. in geology from Northern Arizona University in 1976 and an M.S. in geology, with an emphasis in structural geology, from Stanford University. His thesis was titled "Anticlinal kink folds along the Colorado River in Grand Canyon." In 1985, he earned an M.D. from the University of Arizona and did his family practice residency in 1988.



AISHA AL-BELUSHI
Young Professionals Exemplary Service Award

Citation—a natural leader and gifted spokesperson, her motivating winning qualities have played an important role to date in advancing the role of Young Professionals in the Middle East Region.

I first came to know Aisha when she participated in the IBA competition in 2010. She was the star amongst the Sultan Qaboos University students as she was clearly the unassigned leader pulling the team together. I saw in her a natural leader who was motivating the team, and therefore the team members were naturally leaning on her for advice and direction. Her eyes were sparkling with intelligence, as she was not only the cheerleader of the team but also the gifted spokesperson. Although, the team of Sultan Qaboos University did not win the first place in the Middle East IBA competition that year, but they did marvelous as a team and Aisha left a wonderful impression with the judges and everyone that attended the competition. I then immediately recruited Aisha with AAPG as the co-chair for Young Professionals activities in the Middle East Council and for her to overlap with Anwar Beaiji before ending his term. Intisaar Al-Kindy, exploration director at Petroleum Development Oman (PDO) recognized Aisha's talents as well and agreed to make Aisha available to AAPG as she considered this as a great development opportunity for Aisha.

Aisha Al-Bulushi currently working as a seismic interpreter, joined PDO as a QI geophysicist in 2011. She is a graduate in geophysics from Sultan Qaboos University, Oman in 2010 and received her master's degree in Petroleum Geophysics from Imperial College, London (2010-11). Aisha has developed into a strong and energizing leader in her role as chair of AAPG Middle East Young Professionals and Students Support (YPSS) and as coordinator of the Middle East Region Imperial Barrel Award from 2014 to 2017 where she proved to be a natural team motivator gaining the respect and admiration of her peers. In 2014 she co-chaired the Geo 2014 students committee with Anwar Al-Beaiji, the former Middle East YP and Students chair. Together, they coordinated the 5th Middle East regional IBA competition and organized student activities such as Meet and Greet and Short Courses during the GEO Conference.

Aisha organized the first AAPG-ME Young Professionals (YPs) and Students Summit in Muscat, Oman in 2015 in which nine Middle East Universities and their participating young professionals participated at the event. During the summit, a field trip was organized with help from the Geological Society of Oman. A meet and greet for students and YPs to meet industry leaders was also part of the summit along with a Muscat tour organized on the last day of the summit. Aisha chaired the Geo 2016 YP and Students Committee and organized various activities for 18 Middle East and North Africa universities and their participating YPs. These activities included student poster competition, YP panel session, YP non-technical article competition, technical and soft skill short courses, Meet and Greet and fun evening out for the participating YPs and students.

Aisha coordinated three IBA competitions in the region. In 2016, a record number of eight Middle East universities participated in IBA with a first-ever participation from Jordon universities (University of Jordan, Hashemite University and Yarmouk University) and the German University of Technology in Oman. She participated in two Young Professionals leadership events in 2013 and 2014.

Through her involvement in AAPG, Aisha, a natural-born leader, has evolved into a strong, motivating agent for change and has made great strides in developing and advancing the Young Professional movement in the Middle East Region.

Said Al-Hajri

CATHERINE E. CAMPBELL
Young Professionals Exemplary Service Award

Citation—To Catherine E. Campbell in recognition of her passionate devotion to promoting the Geosciences and AAPG and engaging other geoscientists to do the same.

Cat knew early in her life that she was going to be a scientist. Her parents supported her interests in science by taking her to museums, sending her to science camps and helping her meet the discoverer of the *Titanic*, Bob Ballard, one of her early idols. Cat was so enthused about her first geology class at Connecticut College, she stayed up one night early in the semester and read her entire textbook. She also stood in the ocean during a hurricane trying to get data for her honors thesis. Cat went to Miami of Ohio's field camp in Dubois, Wyoming where she got her fill of rock types, faults, anticlines and stratigraphy.

After graduating cum laude with a B.A. in environmental studies, Cat knew she needed to go to grad school to get the geological career she wanted. Carol Frost, geology professor at the University of Wyoming, had a project in mind that fit perfectly with Cat's background: isotopic analysis of produced water from coalbed methane wells. Cat's ambition was to get a Ph.D. and enter academia but she interviewed with oil and gas companies and took an internship with BP. She loved it and decided to become a petroleum geologist.

Upon finishing her M.S. she went to work for Encana Oil and Gas in Denver. Her assignments at Encana varied from analyzing production and optimizing field development in various basins to representing Encana on the National Petroleum Council.

In 2011 she left Encana to join Robert L. Bayless, Producer LLC in Denver where she is a senior exploration geologist. Her assignments have included projects throughout the Rockies and in Western Australia.

Cat started volunteering in grade school, where she was a tutor and helped at a local science museum. While a graduate student, she volunteered at Wyoming's Geological Museum, was the AAPG Student Chapter president, and a member of UW's team that competed in AAPG's first Imperial Barrel Award competition. Since moving to Denver in 2007 she has volunteered in many leadership capacities, mostly for AAPG and RMAG, but also for her community. The number of volunteer activities in which she has participated is staggering, especially given the brevity of her career. Some of her AAPG and RMAG activities include

- Chair of the RMS-AAPG IBA competition
- Volunteer Chair for the 2009 and 2015 AAPG ACE meetings in Denver
- Chair of the RMS-AAPG Young Professionals in Denver
- Session Chair RMS-AAPG meeting in Las Vegas, 2016
- Chair of RMAG's Rockbuster's Ball committee
- Committee Member, RMAG Awards
- Committee Member, HoD Nominations Committee
- Secretary-Treasurer RMS-AAPG, 2013-2014
- General Co-chair, RMS-AAPG meeting, 2014
- President Elect RMS-AAPG, 2014-2015
- President, RMS-AAPG, 2015-2016
- Assistant Editor, RMAG *Outcrop*
- RMAG delegate to the AAPG HoD, 2015-present.

Some of her community volunteer activities include making presentations about the geosciences and leading field trips for high school students and local volunteer groups. Cat is an instructor for a University of Colorado course, "Lifecycle of Oil and Gas." She has volunteered for and has been a board member for the Wildlands Restoration Volunteers.

Cat engaged in these demanding volunteer activities while developing her career, getting married, and having two children. At the 2016 RMS meeting, she co-chaired a session and gave

a presentation for which she won the coveted Levorsen Award for her paper on the pitfalls of using hydrogen index as a maturity proxy.

This year Cat will be second vice president for RMAG and a session chair for the RMS Billings meeting. She is both the Source Rock Theme co-chair and Sponsorship co-chair for the 2018 AAPG ACE in Salt Lake City.

Some think our YPs don't get engaged with AAPG because they are too busy their careers and families. Cat Campbell is proof that our YPs are not willing to be part of AAPG, but also capable of successfully managing volunteering with a career and young family.

Randi Martinsen

NICK LAGRILLIERE

Young Professional Exemplary Service Award

Citation—For his unyielding support and accomplishments in expanding the scope of YP involvement in the Association.

Nick Lagrilliere was born in Lier, a small town near Antwerp, in Belgium. He finished his secondary education studying sciences-mathematics at the Athenaeum Arthur Vanderpoorten in Lier, where upon graduation, he won prizes for English and geography, which might have been an early sign of things to come. Nick then attended the Katholieke Universiteit of Leuven and after a detour via the Bio-Engineering Faculty, where he took a pivotal introductory course in geology, he changed his degree choice to a B. Sc. in geology, which he was awarded with distinction in 2007.

Nick had developed a strong desire to gain international experience, with the obvious candidates being the mining and oil and gas sectors. Given his strong interest in seismic data, sedimentology, and paleontology the latter carried his preference.

Later in 2007 he joined the M. Sc. course in integrated petroleum geoscience at the University of Aberdeen, during which time he had an internship with Maersk Oil in Aberdeen. During his internship he evaluated infill-drilling opportunities in a North Sea field. Nick joined AAPG as a student member at the start of his course and became president of the University of Aberdeen AAPG student chapter, also winning the ChevronTexaco prize for the Best Overall M.Sc. Student in 2008. I had the pleasure of meeting Nick for the first time when he attended the AAPG Imperial Barrel Award (IBA) final competition at the 2008 ACE in San Antonio, as a member of the Aberdeen team.

Maersk Oil must have been impressed with Nick because upon his graduation they offered him a position as an associate geologist in the Aberdeen office. Here Nick conducted rock physics forward modeling studies and quantitative seismic interpretation for prospect screening and DHI risk analysis in the UK continental shelf.

In 2009 Nick left on an assignment to the Maersk Oil Copenhagen office where he worked on the structural evolution of the Danish Central Graben and investigated the impact of salt tectonics on sedimentation. He was also involved in well-site geology in the North Sea and screening evaluations for the UK 26th licensing round. In 2010 Nick decided to remain with Maersk Oil in Copenhagen as a geologist. The North Sea continued to beckon and Nick matured a Middle Jurassic prospect and planned Cretaceous and Upper Jurassic exploration wells in the Danish sector. He subsequently started his association with the geology of offshore Angola. He evaluated and matured several prospects and contributed to the planning and execution of a number of deep-water exploration wells.

In 2014, Nick was transferred to Maersk Oil Houston Inc. where he continued his work in Angola, this time in offshore development

projects. He also came to enjoy the delights of an overseas assignment in Houston. The turmoil in the industry resulted in Nick being transferred back to Copenhagen to work on deep-water development projects in Angola and the Gulf of Mexico.

Nick has been a strong supporter of AAPG throughout his career. He has been a member of the Europe Region Students and Young Professionals Committee, and vice chair and chair of the Young Professionals Committee. He was a committee member of the Membership Career Services Committee and is currently an alternate delegate for the Europe Region in the HoD. In 2016 Nick became vice chair and Europe Region coordinator on the IBA Committee and co-chair of the AAPG-SEG Cooperation Committee. He is also a Certified Petroleum Geologist.

Other professional activities include serving on the SEG Geoscientists Without Borders Committee and being involved with the organization of activities of the Petroleum Group of the Geological Society.

I have been honored to have Nick as a friend and AAPG colleague over the past few years. I have been impressed by his commitment to the AAPG, his professionalism and his unyielding support and accomplishments in expanding the scope of YP involvement in the Association. He truly deserves this new Young Professional Exemplary Service Award.

Dave Cook

RYAN LEMISKI
Young Professionals Exemplary Service Award

Citation—To Ryan T. Lemiski, geologist, leader, trailblazer, who dedicated significant effort to AAPG for the advancement of our Association and the Membership

Ryan Thomas Lemiski's road to becoming a Professional Geologist can be defined as one of high sinuosity. Ryan was a typical Canadian kid, a strong love of country, the outdoors and sports, including, of course, hockey. His life changed in the summer of 1995 when he suffered a seizure at his grandparents' house after returning from summer hockey camp. A CAT scan and MRI revealed a diagnosis of a brain tumor. The tumor was in his left temporal lobe and the location of the tumor meant that there was a risk that motor functions such as speech, learning ability, and hand movement could be affected by the operation. Post-surgery, Ryan was fortunate to have experienced little to no side effects after the tumor was removed.

Ryan's childhood involved summer holidays in southeastern British Columbia and a never-ending curiosity and wonderment around how the mountains and valleys were formed, and what mechanism made the hot springs water "hot?"

Even though geology interested Ryan at a young age, his path to the profession was convoluted. When he began his undergraduate studies at the University of Alberta (U of A), in Edmonton, he was on the pre-med path. After a term, he realized quickly that the classes weren't very interesting, decided to switch paths, and enrolled in a first-year earth science course. He quickly fell in love with the geology.

During Ryan's third year of studies he accepted a summer geology position with ConocoPhillips Canada, and from that point onward, Ryan knew that he had finally found his true passion and wanted to work as a geologist in the oil and gas industry.

Ryan's first AAPG experience was when he attended the 2007 ACE meeting in Long Beach as a graduate student. At ACE, he presented a poster on his M.Sc. research and was a co-author of a technical talk. Many of his U of A research colleagues traveled to Long Beach, and one evening they stumbled into the AAPG Student Reception. At that reception awards were being presented for the inaugural AAPG Imperial Barrel Award competition. The following year Ryan captained the first University of Alberta team to a fourth-place finish at the 2008 global IBA competition. This

experience took Ryan to push for the formation of a student chapter at the U of A in 2009.

During Scott Tinker's AAPG presidency, Ryan was invited to attend the inaugural AAPG Student Chapter Leadership Summit. Ryan represented the Canada Region and from that point on has been active passionate volunteer with AAPG.

Ryan's career began in June 2010 when he accepted a role as a petroleum geologist with the Northwest Territories (NWT) Geoscience Office. In this role, he provided geological support during an assessment of the oil potential of Horn River Group strata in the central Mackenzie Valley. His work on the shales of the NWT brought an offer of employment from Talisman Energy who was actively exploring this region. Over the next year, he worked in the exploration new ventures team evaluating unconventional plays across North America and met his future wife, Meghan!

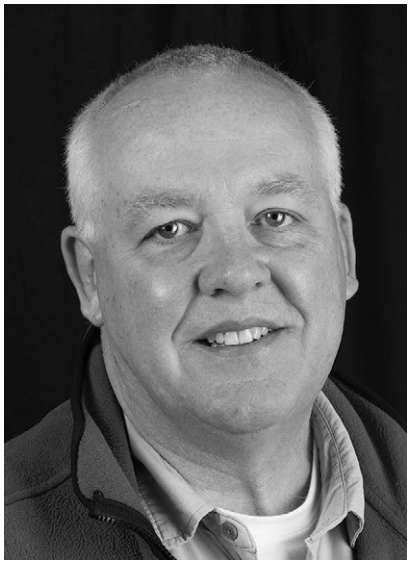
In 2012, Ryan moved to Nexen where his new role involved a discipline change to petrophysics. In this position, Ryan learned unconventional petrophysical analysis techniques applied to the exploration and development of the prolific Horn River shales in northeast British Columbia. Ryan was fortunate to have worked onsite with well-site geologists to call TD on one of Canada's deepest onshore drills in the Liard Basin. In 2015, Ryan returned to an exploration/development geology position to support CNOOC Nexen's Eagle Ford joint venture with Chesapeake.

Today, Ryan is working at NuVista Energy where he is supporting the development of a water source and disposal strategy through geological evaluation of numerous Paleozoic and Mesozoic aquifers.

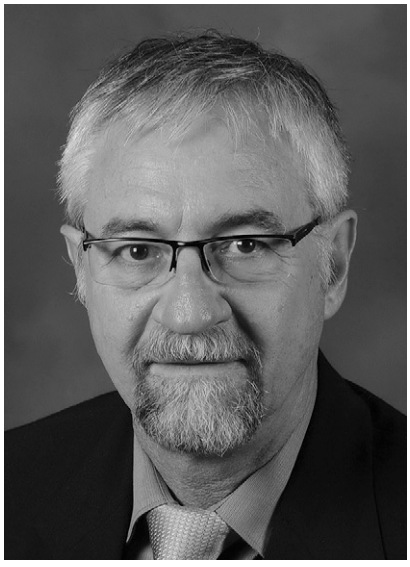
The Young Professional Exemplary Service Award is presented to members that have promoted growth, awareness and opportunities within AAPG for Young Professionals. Ryan is a more than deserving recipient of the inaugural presentation of this award.

On a personal note, I've known Ryan now for close to a decade. He is a wonderful person, a true professional, and a committed volunteer. With leaders like Ryan in our Association, we have a great future.

John R. Hogg



KEITH W. SHANLEY
Wallace E. Pratt Memorial Award



ROBERT M. CLUFF
Wallace E. Pratt Memorial Award

The Wallace E. Pratt Memorial Award for the best paper published in the *AAPG Bulletin* is presented to Keith W. Shanley and Robert M. Cluff (posthumously) for "The evolution of pore-scale fluid-saturation in low-permeability sandstone reservoirs" (*AAPG Bulletin*, v.99, p. 1957-1990).

The ability to predict the degree to which low-permeability sandstones, such as those commonly encountered in many onshore provinces in North America, will be petroleum productive is fraught with significant uncertainty. Water saturation estimates, long the benchmark used to guide operational decisions as well as estimates of in-place resources, have often proven inconclusive when it comes to predicting petroleum production. In many low-permeability provinces reservoir intervals that produce

significant volumes of water are almost indistinguishable from intervals that produce significant volumes of petroleum. Where this has been previously studied the cause of this petrophysical conundrum has generally been ascribed to inaccurate values of formation water resistivity or inappropriate values for saturation and cementation exponents. Nevertheless, even when new electrical properties are determined or when new formation waters are captured and analyzed, the problems with saturation estimation calibrated to fluid production generally persist. Furthermore, in many of these low-permeability provinces it is not uncommon for wells to have widespread hydrocarbon shows while drilling yet economic production often remains much more elusive.

Fundamental to saturation-based petrophysical analysis is the assumption that fluid displacement is described by primary-drainage processes in which petroleum displaces formation waters in the reservoir system for the first time. Although generally not explicitly stated, it is only under these primary-drainage conditions that saturation, fluid production, rock type, and performance have any direct link allowing for reasonable prediction and calibration. To make headway on this particularly nagging petrophysical problem we reexamined this fundamental assumption in light of burial history and basin evolution. It became apparent that basin histories in these provinces were generally characterized by petroleum generation and charge preceeding maximum burial, subsequent uplift, and basin exhumation allowing for the possibility of petroleum re-migration and imbibition and perhaps occurring through multiple phases. Under such circumstances, fluid saturations would not need to be directly related to drainage capillary pressure curves and saturation states ranging from true residual saturation to primary-drainage saturation could be difficult to distinguish, particularly in reservoirs characterized by complex pore-systems and low permeability. Under such conditions it could be exceedingly difficult to relate performance and saturation-based analyses.

It's important to point out that this paper evolved over a period of time and benefitted tremendously from multiple discussions with friends and colleagues too numerous to individually name. Nevertheless, a particular debt of gratitude is expressed to Todd Stephenson, Mike Miller, Tom Feldkamp, Lee Shannon, and John Robinson who served as valuable sounding boards and offered encouragement throughout the process.

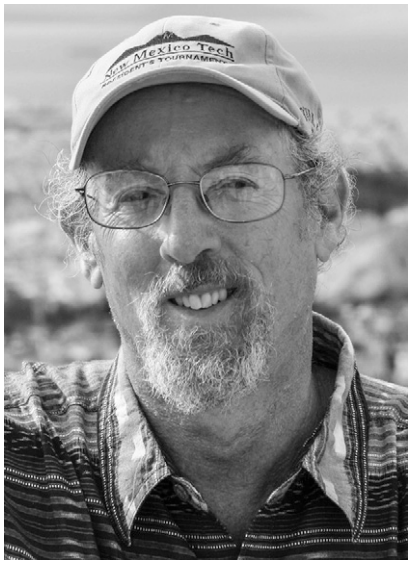
Keith Shanley is a senior geologic advisor with Anadarko Petroleum in Denver, Colorado. He has more than 30 years of experience in petroleum exploration, appraisal, development, research, and teaching. He has published numerous papers and abstracts, edited volumes, and hosted symposia across a wide range of topics including sequence stratigraphy, reservoir sedimentology, description, and architecture, unconventional resources, and the integration of petrophysics, reservoir description, and risk analysis. Keith's work in unconventional resources has been well recognized. The AAPG awarded Keith and his co-authors the Robert Dott Award in 2010 and the Wallace Pratt Award in 2004, and the CSPG awarded Keith and his co-authors the Medal of Merit in 2005. Keith received his B.A. degree in geology from Rice University and his M.Sc. and Ph.D. degrees in geology from the Colorado School of Mines.

Bob Cluff was president and co-founder of the Discovery Group, Inc, a Denver, Colorado based geosciences and petrophysics consultancy, until his death on October 26, 2016. He received a B.S. degree in geology from the University of California Riverside and an M.S. in geology from the University of Wisconsin-Madison. He also received a B.S. in mathematics from Metro State University. As part of the Discovery Group, he worked extensively on reservoir characterization projects in both carbonate and clastic reservoirs, on source rock maturation and basin history modeling, but is best known for his work on the petrophysics of tight gas sandstones and shales.

Bob previously was awarded the Wallace Pratt Award in 2006, with his co-author Keith Shanley and John Robinson, for "Factors controlling prolific production from

low-permeability sandstones: Implications for resource assessment, prospect development, and risk analysis."

DANA S. ULMER-SCHOLLE
Robert H. Dott Sr. Memorial Award



PETER A. SCHOLLE
Robert H. Dott Sr. Memorial Award

JUERGEN SCHIEBER
Robert H. Dott Sr. Memorial Award

ROBERT J. RAINE
Robert H. Dott Sr. Memorial Award

The Robert H. Dott, Sr. Memorial Award is presented to honor and reward the author/editor of the best special publication dealing with geology published by the Assocation. This year's award is presented to Dana S. Ulmer-Scholle, Peter A. Scholle, Juergen Schieber, and Robert J. Raine for *Memoir 109: A Color Guide to the Petrography of Sandstone, Siltstones, Shales and Associated Rocks*.

This memoir is designed as a practical guide for students and professionals to learn the fundamentals of microscopic examination of sandstones, mudrocks, and associated rocks. With more than 1100 color illustrations, it covers the identification of grains, textures, and structures of clastic terrigenous rocks as well as their diagenetic alteration (compaction, cementation, dissolution, and replacement) and porosity reduction or enhancement. It also provides classification diagrams for formal description of those rocks and their porosity.

Although the majority of the outcrop and subsurface examples come from the United States (35 states and Puerto Rico), there are representative photographs from 32 other countries, including many from the offshore areas. The foldout birefringence chart and an included DVD with Powerpoint files of all the petrographic images provide additional aids for instructors and students.

Dana S. Ulmer-Scholle developed an early love for geology while growing up on the classic Upper Ordovician outcrops around Cincinnati, Ohio. She received a B.S. degree in 1981 from the University of Cincinnati and a M.S. degree (1983) and Ph.D. (1992) from Southern

Methodist University. Dana currently is the co-owner of Scholle Petrographic, LLC, a petrographic consulting company. Dana is also an associate research professor in the department of Earth and Environmental Sciences at the New Mexico Institute of Mining and Technology. She teaches carbonate-related courses including petrography and depositional/diagenetic models at the university as well as reservoir-related courses for AAPG and the PTTC/Rocky Mountains. Dana has worked, or consulted, for a number of companies including Amoco Oil and Gas Co., ARCO Exploration, ARCO International, Mobil Research, and Maersk Oil and Gas.

Her research interests include CO2 sequestration in carbonate and siliciclastic systems, carbonate sedimentology and diagenesis, carbonate and siliciclastic petrography, low-temperature isotope and trace element geochemistry, fluid inclusion analysis and fluid flow histories in sedimentary rocks. While at New Mexico Tech, she has also been involved in environmental investigations that include heavy-metals bioremediation and fate-and-transport of heavy metals in the environment.

She is the author, coauthor or editor on numerous papers, reports, books and CD-ROMs. Peter Scholle and Dana coauthored *AAPG Memoir 77 A Color Guide to the Petrography of Carbonate Rocks*, which also received the Robert H. Dott, Sr., Memorial Award in 2005.

Peter A. Scholle received his B.S. in geology from Yale University in 1965 and got his Ph.D. in geology in 1970 from Princeton. His professional career includes five years with various oil companies (Cities Service, Gulf and Chevron) and nine years with the US Geological Survey in Reston (Virginia) and Denver (Colorado), including three years as chief of the Oil and Gas Branch. He taught at the University of Texas at Dallas for three years and was Albritton Professor of Geology at Southern Methodist University in Dallas from 1985 to 1999. From 1999 to 2011 he worked at New Mexico Tech where he was the state geologist and director of the New Mexico Bureau of Geology and Mineral Resources (the state geological survey). He has been an author or editor of nine books, including six AAPG Memoirs and has served as president of SEPM, AASG, and AGI. His retirement in July 2011 has given him the freedom to lecture, consult, edit books, and do research projects (or relax, do photography, and camp and hike with his wife and dogs).

Juergen Schieber is a professor of geology at Indiana University and a specialist on shales. He has published extensively (151 papers, 20 guidebook chapters, 4 books, 292 conference abstracts) and he is also an invited lecturer at universities in the US, Canada, Europe, and Asia; at research organizations, industry short courses, and symposia. He is a member of the science team that currently explores the geology of Gale Crater on Mars with NASA's Curiosity rover.

His research is characterized by a holistic approach to shales, and consists of an integration of field studies (facies, stratigraphy) and lab studies (thin sections, electron microscopy, and geochemistry) in order to understand the various factors that are involved in the formation of shales. A key focus point is the experimental study of shale sedimentology via flume studies and related experimental work. Funding for this research is provided by government agencies (NSF, DOE, NASA), foundations (Petroleum Research Fund), and industry via the Indiana University Shale Research Consortium (ExxonMobil, Anadarko, Marathon, Shell, Chevron, ConocoPhillips, Wintershall, Whiting, Statoil) and separate research agreements (Schlumberger/TerraTek; Pioneer Natural Resources). He consults on matters pertaining to shale sedimentology, shale fabric and pore structure, and also teaches short courses on shale sedimentology and facies analysis, as well as microscope based petrography.

His research interests include basin analysis and sedimentology, sedimentology, diagenesis, and pore systems of shales, the genesis of black shales and sediment-hosted mineral

deposits, evolution of the Belt Basin and the Devonian basins of the eastern US, geochemistry of sediments, planetary geology and sedimentary geology of Mars.

Robert J. Raine received his M. Sci. in geology in 2003 and a Ph.D. in geology in 2010 from the University of Birmingham. His thesis was titled "The Durness Group of NW Scotland: a stratigraphical and sedimentological study of a Cambro-Ordovician passive margin succession." From 2008 to 2013 he worked as a reservoir geologist for Ichron Limited carrying out sedimentology and petrography projects for the oil and gas industry. Since 2013, he has worked for the Geological Survey of Northern Ireland to promote and research hydrocarbons and geothermal prospectivity in Northern Ireland.

JOSEPH M. ENGLISH
J. C. "Cam" Sproule Memorial Award

LUKE FERREIRA
J. C. "Cam" Sproule Memorial Award

The J. C. "Cam" Sproule Memorial, presented to the author(s), age 35 or younger at the time of submittal, in recognition of the best paper published by the Association or any affiliated society, division, or section, is awarded to Joseph M. English and Luke Ferreira for "Geologic evolution of the Iraqi Zagros, and its influence on the distribution of hydrocarbons in the Kurdistan region" (*AAPG Bulletin*, v. 99, p. 231-272**).**

This paper focuses on the petroleum geology of the Kurdistan region of Iraq, where numerous oil and gas fields have been discovered over the last decade. The study presents new Triassic and Middle–Upper Jurassic source rock maturity maps for the area and demonstrates that regional first-order trends in thermal maturity show a close correlation to the spatial distribution of oil gravities within the associated reservoirs. This distribution is consistent with compartmentalization of the active source rock kitchens due to Zagros folding, resulting in relatively short-distance migration and charge of the anticlinal structures from the adjacent synclinal lows. The findings of this study will help to guide risk assessment for the remaining prospectivity and future exploration drilling within the Kurdistan region of Iraq.

Grenville A. Lunn and George Yacu were the co-authors of this paper.

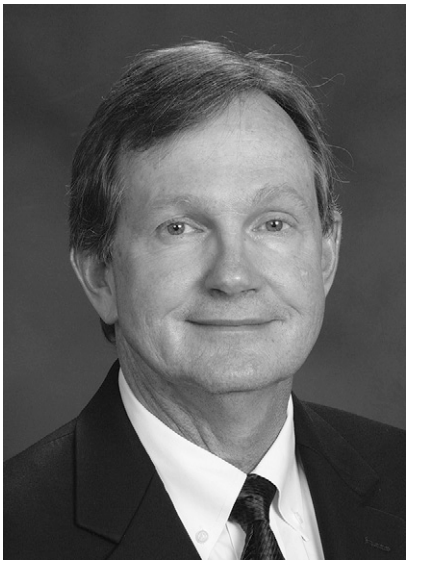
Joe English received his B.A. degree in geology from Trinity College, Dublin, Ireland (2001) and his Ph.D. from the University of Victoria, Canada (2004). He has worked as a petroleum geologist with EnCana Corporation and Nexen Inc., as chief geologist with Petroceltic International, and he is a chartered geologist (C.Geol) under the Geological Society of London. His research interests include geomechanics, tectonics, structural geology, and basin analysis, and he is a previous winner of AAPG's J. C. Cam Sproule Memorial Award (2014).

Luke Ferreira is an exploration geologist with over seven years' experience in the Kurdistan region with Hess Corporation and Perenco. He received a B.Sc. degree (2006) in geology and a M.Sc. degree (2007) in basin dynamics and evolution (petroleum geology) from Royal Holloway, University of London.

He subsequently went on to work for OMV Exploration and Production, and has now left the oil industry to pursue a career in teaching.

MIKE BLUM
John W. Shelton Search and Discovery Award

KRISTY T. MILLIKEN
John W. Shelton Search and Discovery Award



JOHN W. SNEDDEN
John W. Shelton Search and Discovery Award

WILLIAM A. GALLOWAY
John W. Shelton Search and Discovery Award

Mike Blum, Kristy T. Milliken, John W. Snedden, and William E. Galloway received the John W. Shelton Search and Discovery Award for the most outstanding contribution to the AAPG Search and Discovery website titled "Record of Cretaceous through Paleogene Gulf of Mexico drainage integration from detrital zircons."

This presentation was one of three linked presentations in a SEPM Session on Source-to-Sink Analysis at AAPG ACE 2015. The three presentations together presented a new workflow for reconstructing drainage basin contributing areas and sediment routing systems, so as to predict the scales of basin-floor fan systems based on empirical source-to-sink scaling relationships. This workflow was tested on the Gulf of Mexico basin, where the answers are known, and can then be exported to other lesser-known basins worldwide. These papers collectively demonstrate that drainage basins can be reconstructed for discrete time periods using detrital zircon U-Pb geochronology and provenance techniques, combined with measurements of point-bar thicknesses from well logs, and these semi-quantitative reconstructions can then be used to predict, at the first order, the likely scales of basin-floor fans.

Mike Blum received his Ph.D (1992) from the University of Texas at Austin, focusing on climatology, geomorphology, and sedimentology. He held faculty positions at Southern Illinois University (assistant professor 1991-95), the University of Nebraska-Lincoln (assistant and associate

professor, 1995-2003), and Louisiana State University (Harrison Family Professor, 2003-08), then served as research advisor at Exxonmobil Upstream Research (2008-14). His research interests include fluvial to shallow-marine processes and deposits, connections between fluvial-deltaic and deepwater systems, and source-to-sink analysis. Mike is now the Ritchie Distinguished Professor in the Department of Geology of the University of Kansas, where he pursues these themes through his research and teaching.

Kristy T. Milliken is currently an adjunct researcher with the University of Kansas Department of Geology and adjunct instructor with Colorado Mountain College in Steamboat Springs, Colorado. Her specific research interests are fluvial and shallow marine clastic depositional systems.

John W. Snedden is senior research scientist and director of the Gulf Basin Depositional Synthesis Project at the Institute for Geophysics, University of Texas at Austin. He received his B.A. from Trinity University (San Antonio), his M. S. at Texas A&M University (College Station), and Ph.D. from Louisiana State University (Baton Rouge). With multiple domestic and international assignments, he worked for Mobil and ExxonMobil for over 25 years in research, exploration, development, and production prior to joining UT. John has published on modern and ancient lagoonal, fluvial, deltaic, shelfal, and deepwater deposits as well as sequence stratigraphic correlation and reservoir connectivity. He has served as vice president of GCS-SEPM and secretary-treasurer of SEPM. John has won the SEPM Excellence in Oral Presentation award, GCAGS Journal Best Paper Award, and AAPG's A.I. Levorsen Best Paper Award.

Bill Galloway obtained his B. S. from Texas A & M University in 1966, and M.A. (1969) and Ph.D. (1971) in geological sciences from The University of Texas at Austin. He first worked in the Exploration Research Division for Conoco, then returned to Austin as a research scientist at the Texas Bureau of Economic Geology in 1976. Ten years later he moved to the Department of Geological Sciences at UT, where he taught until his retirement. In 1995 he became a principal investigator on the Gulf Basin Depositional Synthesis (GBDS) project, an industrial consortium at the UT Institute for Geophysics. He is currently the Emeritus Morgan Davis Centennial Chair in Petroleum Geology in the Department of Geological Sciences, and continues to consult with the ongoing GBDS project at UTIG. He is the recipient of numerous awards, including the SEPM Twenhofel Medal, Gulf Coast Association of Geological Societies Outstanding Educator Award, Gulf Coast Section SEPM Doris Curtis Award, and Grover Murray Memorial Distinguished Educator Award.

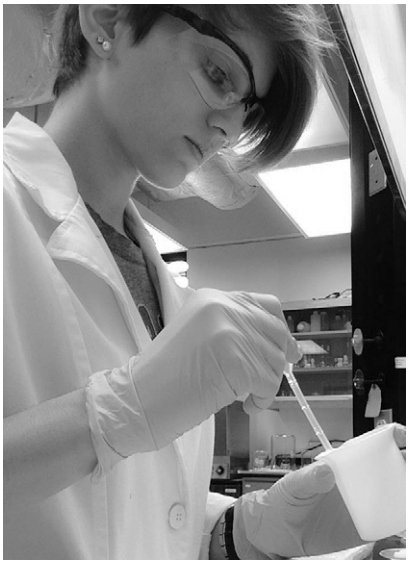
MARTIN J. KENNEDY
George C. Matson Memorial Award

The George C. Matson Memorial Award for the best paper presented during an oral technical session at the Annual Convention and Exhibition is presented to Martin J. Kennedy for "Seeing is believing; the importance of trace minerals to the reservoir properties of shales determined by electron imaging and mineral mapping.

The paper describes new technology using a combination of microbeam analysis and mineral modelling to image organic rich shale. This has assisted the study of the reservoir and rock properties of shales in unconventional plays by allowing us to see the

grain to grain contacts and mineral phase transformations that were previously inaccessible because of the extremely fine grain size of particles in mudstones. The quantification of mineral phases and phase associations will provide a powerful source of data for rock mechanical models as well as studies of how shale is deposited and undergoes diagenesis. We feel this approach offers a quantum leap in understanding shale reservoir potential.

Martin Kennedy is head of the Department of Earth and Planetary Sciences at Macquarie University. He is a sedimentologist and geochemist who specializes in organic rich shale geochemistry and petrology. His initial study of organic rich rocks occurred at ExxonMobil Upstream laboratory in the 1990s. He received a B.Sc. degree from the University of Wisconsin, Madison, and a Ph.D. from the University of Adelaide. Subsequently, he was a research associate at Cornell University, the Rubey Research Fellow at UCLA, senior research geologist at Exxon Upstream Research Company, and professor of geology at the University of California. He returned to the University of Adelaide in 2010 where he founded the Sprigg Geobiology Centre before moving to Macquarie University in 2015. He heads a shale consortium focused on developing new methods of shale imaging and characterization.



JENNA M. DIMARZIO
Jules Braunstein Memorial Award

SVETOSLAV V. GEORGIEV
Jules Braunstein Memorial Award

HOLLY STEIN
Jules Braunstein Memorial Award

JUDITH HANNAH
Jules Braunstein Memorial Award

The Jules Braunstein Memorial Award for the best poster presented at the AAPG Annual Convention and Exhibition is presented to Jenna M. DiMarzio, Svetoslav V. Georgiev, Holly Stein, Judith Hannah for their

poster "Effect of precipitation of asphaltenes on Re-Os isotopic ratios.

Pinpointing the time or time interval when oil is created, when it migrates, and when it is emplaced in a reservoir rock is fundamental knowledge for petroleum exploration. The work presented in this poster shows how the AIRIE Program uses natural samples and real petroleum systems for both industry-relevant and more fundamental experimental work. For the last five years, we have developed technologies to isolate the Re-Os (rhenium-osmium) isotopic clock in different part of an oil. Putting those parts together has given us crude-asphaltene-maltene isochrons, that is, the first radiometric dates for individual crude oil samples. The results in this award-winning poster are a direct follow-on to our analytical breakthrough in dating crude oils—that is, what sub-fractions of the oil carry and preserve the Re-Os radiometric clock? Since the writing of the abstract, and since the poster presentation at the 2016 AAPG ACE in Calgary, further significant strides forward have been made. The AIRIE Program now reconstructs whole petroleum systems, including the timing of multiple oil charges and oil-oil and oil-water mixing. Residual oil, tar mat formation, live oil captured in drill core, and oil samples drawn from the reservoir are all part of the Re-Os dating mission.

Here we present the work published in the 2016 AAPG ACE abstract, and immediately subsequent work on the same samples in the last year. After our first direct dating of a crude oil, we used the same oil (Noto, Gela, Sicily) to determine which sub-fractions of the asphaltene component held the Re and Os. This was accomplished by precipitating asphaltene sub-fractions of different polarity using variable proportions of dichloromethane with heptane, and acetone with toluene. Ultimately, and as hypothesized, we determined that Re and Os were held in highly polar fractions. In the maltene fraction, we found significant Re (and Os) in the resins and aromatics (8-22 ppb Re), whereas the saturates were near detection limit (0.03-0.25 ppb Re). We show preferential mobility of radiogenic daughter ^{187}Os, which leaves its original molecular home, formerly occupied by parent ^{187}Re, to join the existing common Os pool in an oil, demonstrating that Re and Os occupy different molecular sites in the asphaltene concoction. This discovery is profoundly important for working with the Re-Os isotopic clock in reconstructing whole petroleum systems. Since our work follows the journey of oil and explores what might disturb or reset the radiometric clock along the migration path to reservoir, we have to know the fundamental chemical behavior of Re and Os in oils. The 2016 AAPG ACE poster laid out the vital first steps in this regard, and expanded our ability to interpret Re-Os data for industry-sponsored work on natural petroleum systems.

The work presented at AAPG ACE was supported by the CHRONOS project, backed by a consortium of Norwegian petroleum companies. Colorado State University provides no salaries or operational support for the AIRIE Program. The lead author on this poster is the AIRIE Program's M.S. graduate student, Jenna DiMarzio. The second author is AIRIE research associate Svet Georgiev, who spearheaded AIRIE's work with oils. The remaining two authors are proud advisors Holly Stein, director and founder of the AIRIE Program, and Judith Hannah, program co-director.

We are grateful to the AAPG for the opportunity to honor the work and career of Jules Braunstein through acceptance of this prestigious award.

Jenna M. DiMarzio received her B.S. in chemistry from Arcadia University in 2013, and is currently working toward finishing her M.S. in geosciences at Colorado State University (CSU). In college, she was selected to participate in the prestigious Museum Studies Internship Program at the Philadelphia Museum of Art, where she worked as a hand-dyer for the Costume and Textiles Department. After taking an introductory geology class in her senior year, she decided to pursue a career in the geosciences. For the past two years she has worked as a graduate research assistant within the AIRIE Program at CSU. Her research focuses on studying Re-Os systematics within the asphaltene and maltene fractions of crude oil,

as this information will help to inform our interpretation of Re-Os geochronology in the context of petroleum systems. Her interests include geochemistry, organic and environmental chemistry, mining processes, and mineralogy, and her free time is occupied with playing violin, fiber arts, cooking, and enjoying the outdoors.

Svetoslav Georgiev received his Ph.D. from ETH, Zürich, Switzerland, in 2008. For the past seven years, he was first a post-doc and is now a research associate with the AIRIE Program, Colorado State University. His main interests are Re-Os geochronology of oils and shale source rocks, and reconstruction of past environmental conditions and processes from geochemical and isotopic records preserved in sedimentary rocks. Published examples together with colleagues from AIRIE and industry partners include the first direct Re-Os ages for individual crude oils (Sicily), the first analyses of Cd isotopes in sedimentary rocks (shales) that were used to constrain paleoproductivity in past oceans, and the first Re-Os ages and isotopic studies on organic-rich shales deposited near the Permian-Triassic mass extinction interval (East Greenland, mid-Norwegian shelf; also shales from western Canada). Previously, he worked on the geochemistry of primitive and evolved island-arc magmatic rocks (Bulgaria), and on high-precision U-Pb zircon dating of igneous terranes by ID-TIMS and LA-ICPMS methods. His additional broad interests include the origin and evolution of life and how this shaped our planet, all things geochronology, geochemistry and novel isotopic proxies, physical volcanology, and petrified forests.

Known for her enthusiastic curiosity-driven approach to science, and for her ability to cross the academic-industry divide, Holly Stein began her career in the mineral industry. During her early work with carbonate-hosted lead-zinc deposits, she registered the significance of oil and bitumen in sedimentary ore systems. Even as her focus shifted to magmatic-metamorphic environments, where she remains well known for her expertise in molybdenum deposits, she continued to query the role of hydrocarbons in ore-forming environments. At the center of her field-oriented approach is the absolute time component required to reconstruct resource-forming events. Stein and her research team, the AIRIE Program, pioneered the radiometric dating of sulfide minerals using the Re-Os (rhenium-osmium) isotopic clock. Her persistence and outreach has made molybdenite a household word in today's geoscience community. Radiometric dating of pyrite and arsenopyrite quickly followed. Moving from sulfides to organic material, the team pioneered the sampling protocol, now in use by other labs, for Re-Os dating of organic material in black shales. Sampling organic-rich laminations at the mm-scale provides precise Re-Os depositional ages for shales, giving time pins for biostratigraphy and global correlations. In 2016, her team achieved a new milestone—the first direct dating of a single crude oil. Using their unique combination of technical, developmental, and geologic skills, the AIRIE Program now dismantles and reconstructs whole petroleum systems in absolute time. Unwavering support from the industry is a measure of the success of the team she has built and the relevance of their work. Stein is a Fulbright Scholar, received the SEG Silver Medal in 2005, and the Helmholtz-Humboldt research prize in 2008. She founded the AIRIE Program at Colorado State University without university financing, managing the ongoing challenge of securing external funding for salaries and the program's operation. She holds an appointment as professor at CEED, University of Oslo, and is adjunct faculty at Curtin University and University of Waterloo.

Judith Hannah started her professional career in the field, mapping and sampling thick sequences of arc volcanics, and using petrography and geochemistry to elucidate their origins and ties to associated ore deposits. Field-based studies, augmented by isotope

geochemistry, continued as she changed focus to felsic volcanism, shallow instrusive bodies and caldera systems, hosts for varied ore deposits. Collaborations with the (then future) founder of the AIRIE Program, Holly Stein, led to development and application of the Re-Os isotopic system in the high-temperature world—mostly while Hannah was distracted by challenges in administration. In 2000, she undertook the first effort to date diagenesis using pyrite in sulfidic sedimentary rocks, leading to dating of the rise of atmospheric oxygen (with Stein and others). This work opened an entirely new world for the AIRIE Program: placing time pins in the sedimentary record using Re-Os chronology in organic-rich sedimentary rocks. Step by step, over the past decade, the AIRIE team has refined dating of shales, and expanded into the world of migrated hydrocarbons. Today, the group is taking hydrocarbons apart, separating these complex mixtures of organic molecules into subfractions, to understand the residence of Re and Os within oils and use their isotopic ratios to follow hydrocarbon evolution in time from source to reservoir. The long journey from high-temperature to low-temperature processes, from magmatic to sedimentary systems has been a wild ride, but the diversity of experience is an invaluable source of insight.

RODERICK PEREZ ALTIMAR
SEG/AAPG Best Paper in *Interpretation* Journal Award

KURT J. MARFURT
SEG/AAPG Best Paper in *Interpretation* Journal Award

Roderick Perez Altimar and Kurt J. Marfurt have been recognized for their authorship of the best paper published in the SEG/AAPG *Interpretation* journal titled "Identification of brittle/ductile areas in unconventional reservoirs using seismic and microseismic data: Application to the Barnett Shale."

Brittleness is a key characteristic for effective reservoir stimulation and is mainly controlled by mineralogy in unconventional reservoirs. During this research Perez and Murfurt evaluated two of the more popular brittleness estimation techniques and apply them to a Barnett Shale seismic survey in order to estimate its geomechanical properties, and created a survey-specific BI template in the $\lambda\rho$ versus $\mu\rho$ domain. This template was used to predict BI from elastic parameters computed from surface seismic data, providing a continuous estimate of BI estimate in the Barnett Shale survey. The results were validated through a suite of microseismic experiments that shows that regardless of where the well is perforated, the events appear to preferentially grow towards the more brittle areas, suggesting the growth of hydraulic fractures into the brittle petro-type.

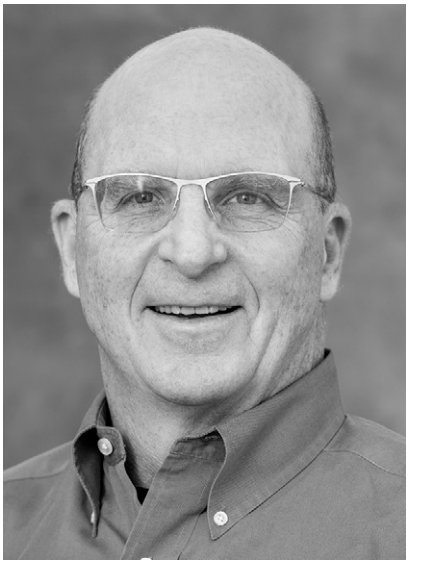
Roderick Perez was born and raised in Caracas, Venezuela where he also completed his undergraduate degree in geophysical engineering at the Universidad Simon Bolivar. After spending a year as exchange student at the University of Oklahoma during his undergraduate studies, he stayed on with the program and completed his M.S. in geology and Ph.D. in geophysics, with the guidance of Roger Slatt and Kurt Marfurt, respectively. While at OU, Perez was part of the winning

team in the 2008 AAPG Imperial Barrel Award competition representing the University of Oklahoma, helping win notoriety and funding for the university. His Ph.D. dissertation research focused on seismic attributes applied to reservoir characterization of unconventional reservoirs, with results calibrated to available microseismic data.

Perez is an active reviewer with the AAPG-SEG *Interpretation* journal, associate editor of the journal of the EAGE *Latin American Applied Geoscie*nce where he is responsible for analyzing QI, seismic attributes, and unconventional reservoir articles, as well as having sat on several M.S. and Ph.D. committees. Currently, Perez is pursuing a double program for an M.B.A. with finance at the Universidad de los Andes in Bogota, Colombia. While still participating enthusiastically in several committees with AAPG and SEG, Perez continues to stay informed of new advancements in the oil and gas community and always looks forward to learning on new datasets and finding new ways to provide value back to companies with which he has the opportunity to collaborate.

Perez is currently working for Pacific Exploration and Production (former Pacific Rubiales), where he focuses on seismic attributes, geostatistics, geomorphology, petrophysics, core analysis, reservoir modeling and stimulation, and inversions along with other technical tasks to improve the characterization of reservoirs primarily in Los Llanos Basin and Valle Inferior del Magdalena Basin, among other basins in Colombia and abroad. At previous roles Perez has managed the key technical/solutions relationships for the world's largest and most innovative exploration and production companies, has performed technical consulting services and overseen project delivery in Latin America, Texas, and Oklahoma, and has worked the Gulf of Mexico utilizing seismic attributes, geopressure data, and sequence stratigraphy for prospect evaluation.

Kurt J. Marfurt joined The University of Oklahoma in 2007 where he serves as the Frank and Henrietta Schultz Professor of Geophysics within the ConocoPhillips School of Geology and Geophysics. Marfurt's primary research interest is in the development and calibration of new seismic attributes to aid in seismic processing, seismic interpretation, and reservoir characterization. Recent work has focused on applying coherence, spectral decomposition, structure-oriented filtering, and volumetric curvature to mapping fractures and karst with a particular focus on resource plays. Marfurt earned a Ph. D. in applied geophysics at Columbia University's Henry Krumb School of Mines in New York in 1978 where he also taught as an assistant professor for four years. He worked 18 years in a wide range of research projects at Amoco's Tulsa Research Center after which he joined the University of Houston for eight years as a professor of geophysics and the director of the Allied Geophysics Lab. He has received SEG best paper (for coherence), SEG best presentation (for seismic modeling) and as a coauthor with Satinder Chopra two best SEG posters (for curvature) and best AAPG technical presentation. Marfurt also served as the EAGE/SEG Distinguished Short Course Instructor for 2006 (on seismic attributes). In addition to teaching and research duties at OU, Marfurt leads short courses on attributes for the SEG and AAPG.



THOMAS MURPHY
Gabriel Dengo Memorial Award

The Gabriel Dengo Memorial Award is given each year in recognition of the best paper presented at the previous year's AAPG International Conference and Exhibition. This year, the award is presented to Thomas Murphy for "Groundwater environmental liability management using baseline sampling programs."

The objective of the presentation was to provide an

approach to reduce potential environmental liabilities associated with oil and gas exploration activities in areas where groundwater is used as a primary drinking water supply.

Best Management Practices (BMPs) are presented which can be employed in voluntary programs worldwide as oil and gas operations continue near valuable groundwater resources. Operators can minimize their environmental liability through voluntary baseline groundwater sampling programs which demonstrate the water quality conditions prior to and post project development, often reducing or eliminating negative publicity, legal actions, or mitigation efforts associated with perceived operational environmental impacts.

Traditionally, oil and gas operators have controlled their groundwater environmental liabilities through remedial actions after the groundwater has been impacted with hydrocarbons and salt. In recent years, a handful of US state regulatory agencies have promulgated prescriptive rules to establish baseline conditions in groundwater aquifers in close proximity to planned oil and gas production prior to drilling and then to continue monitoring of the groundwater for a specified period of time following well completion. The intent of the rules are to assure landowners and regulators that drinking water supplies are being protected as oil and gas development occurs. Colorado was the first US state to establish such rules during coal bed methane development in the San Juan Basin in southwest Colorado in 1996. Baseline sampling programs expanded statewide under the Colorado Oil and Gas Conservation Commission (COGCC) and culminated with COGCC Rules 608 and 609 in 2010. Other states adopted similar rules and guidance in areas of oil and gas production. Throughout the development and implementation of these rules, a series of best management practices have been developed and can be employed in voluntary programs worldwide as oil and gas operations continue near valuable groundwater resources. Operators can minimize their environmental liability through voluntary baseline groundwater sampling programs which demonstrate the water quality conditions prior to and post project development, often reducing or eliminating negative publicity, legal actions, or mitigation efforts associated with perceived operational environmental impacts.

Tom Murphy is a Certified Professional Geologist. He has a B.S. in geology and geophysics from the University of Wisconsin; an M.S. in geology from Oregon State University; and over 40 years of professional experience. Tom began his career as an exploration geologist in the oil and gas industry. Since 1986, he has worked in the environmental industry providing practicable solutions for the management, reduction or elimination of environmental risk. He is president/CEO of LT Environmental, Inc. (LTE) which he began in 1992. LTE is an environmental and engineering firm headquartered in Colorado with regional offices throughout the Rocky Mountains.

Ashley Ager is co-author of this paper.

DANIEL EMILIANO BOLAÑOS-RODRIGUEZ
Ziad Beydoun Memorial Award

MANUEL CRUZ-CASTILLO
Ziad Beydoun Memorial Award

ADRIANA ACOSTA-ÁNGELES
Ziad Beydoun Memorial Award

The Ziad Beydoun Memorial Award is given each year in recognition of the best poster presented at the previous year's AAPG International Conference and Exhibition. This year, the award is presented to Daniel E. Bolaños-Rodriguez, Manuel Cruz-Castillo, and Adriana Acosta Ángeles for "Conceptual geological model about hydrocarbon flow through fractures in siliciclastic sequences of the Chicontepec Formation.

The rocks of the Chicontepec Formation are exposed on the western margin of the Tampico-Misantla basin, and is currently considered one of the Mexico's reserves with the greatest production potential.

However, the Chicontepec oil fields are made up of highly heterogeneous siliciclastic sequences, with low porosity and permeability, and with a reduced recovery factor.

In siliciclastic reservoirs, natural fractures can enhance or inhibit the production and stimulation processes of a well, so it is important to discriminate qualitatively and quantitatively the fracture systems and faults involved in the hydrocarbon flow.

This work was part of an integral project developed at the Mexican Institute of Petroleum, focused on the static and dynamic characterization of the Amatitlan block based on seismic information, well cores and similar outcroppings, which allowed structural analysis in several orders of magnitude.

This derived in a conceptual model of hydrocarbon flow controlled by fractures at metric and micro-metric scales, which was statistically correlated with the regional structures identified at the reservoir.

The results are an antecedent for the integration of fracture distribution parameters in the exploration and evaluation of the oil fields in this area, both at the Chicontepec Formation level and at the Upper Jurassic shale prospective interval.

Daniel E. Bolaños is a structural geologist who has a background in strain analysis in contractional structures at the Mexican fold and thrust belt. He has implemented geometric, kinematic, orientation field, and structural domain analysis of tectonic elements at the micro-, meso-, and macroscales in order to understand deformation processes. His current activity is focused on static characterization of fracture systems in highly heterogeneous rocks and to explore the correlation between sedimentary facies distribution and fracture intensity values. Three-dimensional surveying and modeling techniques, LIDAR and photogrammetry, has been part of his expertise characterizing structures in siliciclastic and naturally fractured outcrop analogues.

With 18 years of experience at the Mexican Institute of Petroleum, Manuel Cruz is a geologist who has worked with clastic sedimentary rocks, outcrop analogues, well logs interpretation, and has a wide experience in the Tertiary basins of Southeast Mexico, in the Macuspana Basin, in the Reforma-Akal horst, in the Chicontepec Basin, and in the Burgos Basin. He now works on the Tuxpan platform in an oil recovery project, characterizing the geological properties of the reservoir.

Adriana Acosta is a geologist engineer in the Extra Heavy Oil Fields Department at Petroleos Mexicanos (PEMEX). She graduated in 2007 from Instituto Politécnico Nacional in Mexico. She worked for five years in Mexican Institute of Petroleum as a junior geologist where she participated in several projects in shallow risk studies in Gulf of Mexico deep waters and static characterization studies considering fractal properties of the rocks. In 2013 she became part of the PEMEX staff, where

she works as a production geologist, planning the development of Ayatsil-Tekel-Utsil oil fields, documenting well locations according to the standard of FEL (front-end loading) methodology and following the drilling of new development wells.

PAUL STRUNK
L. Austin Weeks Memorial Medal

The L. Austin Weeks Memorial Award is given in recognition for extraordinary philanthropy and service directed to advance the mission of the AAPG Foundation. The 2017 recipient is Paul Strunk.

Paul M. Strunk is being recognized for something he's done consistently over the past three decades: provided valuable support and leadership to the AAPG Foundation—and through those efforts, provided valuable educational opportunities to an entire generation of geoscientists. Strunk is the tenth recipient of this award.

"Deana and I are proud to support and be involved with the AAPG Foundation," Strunk said after being told of the honor. "The Foundation has done an excellent job of providing funding for a vast array of educational and research programs that benefit society and the geologic profession. Now, to receive the Foundation's L. Austin Weeks Memorial Medal," he added, "is an awesome and tremendous honor."

Paul and his wife, Deana, have been donors to the AAPG Foundation since 1994, when he joined the Trustee Associates, a distinguished group of donors who provide support for the Foundation's fundraising efforts, as well as providing counsel and leadership to the Trustees.

It was the Strunks' belief in the new Military Veterans Scholarship program–and their lead gifts to its fundraising efforts–that made the program a reality for the Foundation. In fact, in recognition of their commitment to the program, the Trustees recently renamed the program the Deana and Paul Strunk Military Veterans Scholarship Program. Because of their generosity, the program is beginning its third year of accepting applications for scholarships from deserving veterans.

Strunk was selected as a member of the Foundation's Members of the Corporation in 2000 and appointed as a Trustee to the AAPG Foundation in 2011. During his time as a Trustee, Strunk also served on the Foundation's Audit Committee. Strunk stepped down from the Board of Trustees earlier this year and is now a Trustee Emeritus.

Strunk, a successful explorationist and CEO of American Shoreline, in Corpus Christi, Texas, received his bachelor's degree from Kansas State University (KSU) in 1956, and began his career as a geophysicist with Pan American Petroleum Corp. One year later he returned to KSU for his master's degree.

He then moved to Corpus Christi where he worked as a geologist for Pan American. In 1960 he joined Skelly Oil Company as an exploration geologist, and in 1964 he became an independent geologist. He and an associate, J.B. Clark, formed Fontana Oil and Gas in 1974. Fontana merged with Centura Inc. in 1976, and Strunk became president of Centura. In 1978, he resigned from Centura to start American Shoreline Inc., a successful oil and gas exploration company.

During his career in oil and gas exploration, Strunk has been involved with the discovery and development of over 36 oil and gas fields, most of which were in the Gulf Coast area of south Texas.

He has been an active member of AAPG since 1960, serving on numerous committees and engaging in several leadership roles, including

- Served as a two-term delegate in the House of Delegates
- Was a member of the Advisory Council
- Served on the Insurance Committee, Twenty-First Century Committee, Committee on Committees, Environmental Geology Committee, Headquarters Management Committee and Committee on Investments (chair in 1993-97)
- Held the office of AAPG treasurer (1988-90) and was a candidate for president-elect (1994-95)
- Was a founding member of the Division of Environmental Geosciences and a member of the Division of Professional Affairs
- Received the AAPG Certificate of Merit in 1991 and the Distinguished Service Award in 1993

Strunk also has held numerous committee positions and offices for the Corpus Christi Geological Society and the Gulf Coast Association of Geological Societies, American Institute of Professional Geologists and Society of Professional Earth Sciences.

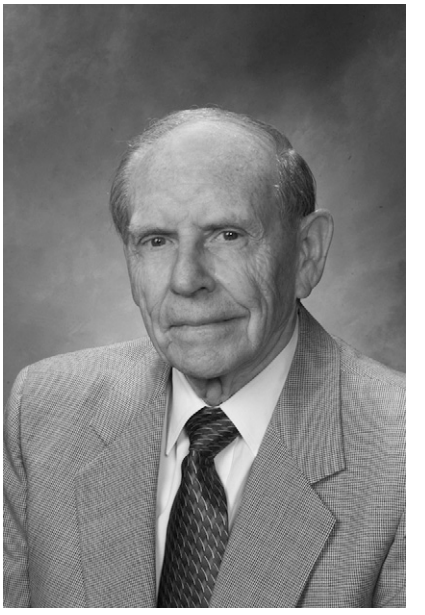
Strunk's philanthropy and service does not stop with the AAPG Foundation; he actively supports the geology program of his alma mater KSU. Specifically, the Strunks provide support to KSU to the geoscience building program, the Strunk Geology Fellowship, and other geology funds. Strunk has served on the KSU Advisory Council for the Department of Geology and is a member of the President's Club.

"Kansas State and the Kansas State Foundation are incredibly grateful for the generosity and leadership the Strunks have demonstrated through their continuous support," said Shelia J. Walker, senior director of development of the KSU Foundation. "Paul is very deserving of the AAPG Foundation's L. Austin Weeks Memorial Medal," she added, "and thank you for renaming the Military Veterans Scholarship after the Strunks."

In addition to his professional activities, Strunk has been active in civic and governmental affairs.

- He supports a number of charities in his local area, which focus primarily on programs for children and families, including presenting a $10,00 check to Lisa Saenz, unit director for the Boys and Girls Club of Corpus Christi.
- He has served on the Corpus Christi Independent School District Building Advisory Committee and on the oil industry segment of the United Way Committee.
- In 1996 he was appointed by the governor of Texas to serve on the Committee for Property Tax Relief.
- He currently is serving on the Energy Resource Committee of the Interstate Oil and Gas Compact Commission, and is a member and has served on the executive committee of the Texas Independent Producers and Royalty Owners Association.

In other words, many people have many reasons to be grateful for Strunk's commitment, dedication, and philanthropy. That goes doubly for the AAPG Foundation.



FRANK HARRISON JR.
Chairman's Award

Longtime AAPG Foundation supporter and leader Frank Harrison Jr., a founder of the group's highly successful Trustee Associates, is this year's recipient of the AAPG Foundation Chairman's Award. This award, given in recognition of those who have made extraordinary contributions (monetary or service) to the AAPG Foundation and who call attention to the role and value of the Foundation.

Harrison's relationship with the Foundation began in 1978 when he was invited by James

E. Wilson to become a founding member of the Trustee Associates, a distinguished group of donors who provide support for Foundation fundraising efforts and counsel and leadership to the Trustees.

Harrison, believing the Foundation is essential to the future of AAPG, said setting up the Trustee Associates was among the most important decisions made by the AAPG Foundation. Since that time, he has called attention to the Foundation through service as chairman for the group (2000) and sponsored more than 14 new Trustee Associates.

In 1986, when the Foundation became an Oklahoma nonprofit organization, Harrison was appointed as a Regular Member of the Members of the Corporation, a seat he still holds. The members of the Members of the Corporation meet annually to keep abreast of Foundation activities and business.

This lifelong Louisiana resident and Louisiana State University (LSU) graduate (1950) served as president of AAPG from 1981-82. Harrison's optimism about the oil and gas industry during his presidency prompted the Executive Committee members to give him a sign that read "Optimistic Oil Company – Frank W. Harrison, president." After giving thought to the name and his outlook about the oil and gas industry, Harrison did indeed establish the Optimistic Oil Company, where he serves as president.

After he graduated from LSU with a bachelor's degree in petroleum geology, Harrison served in the US Army from 1951-53. He then worked as a geologist for Union Producing Company and Seaboard Oil Company in New Orleans.

In 1956 Harrison moved to Lafayette, where he accepted a position as the district geologist for Trans-Tex Drilling for a year before joining American Natural Gas production as head geologist. In 1959, he began his successful career as an independent and consulting geologist in south Louisiana.

Harrison, an AAPG Honorary Member, has served on numerous committees since joining AAPG in 1954; his service as a Visiting Geoscientist, as well as a committee member for that program and the Distinguished Lecture program allowed him to share his optimism about the oil and gas industry and the need for innovative thinking and sound geological reasoning to develop drillable plays with future geoscientists.

Harrison has given generously of his time–both personally and professionally–by serving on boards and holding offices for many other organizations. His professional affiliations include service as president of the Gulf Coast Association of Geological Societies (1980); Lafayette Geological Society (1961-62); the American Geosciences Institute (1989-90); and the Louisiana Oil and Gas Association (1977-78).

Harrison received the Colonel Edwin L. Drake Legendary Oilman Award in 2003, honoring a lifetime of achievement within the oil and gas industry by The Drake Foundation.

JULIE MITCHELL
Teacher of the Year Award

Julie Mitchell, a geology teacher from Erie High School in Erie, Colorado, has been named the 2017 AAPG Foundation's Teacher of the Year.

The Teacher of the Year (TOTY) award, funded and presented annually by the AAPG Foundation, is intended to honor and encourage excellence in geoscience education. Mitchell, who has taught high school earth science for more than

20 years, was chosen as the top teacher by a panel of national judges.

Upon being notified of the honor, Mitchell said she is "incredibly honored and humbled to be receiving the prestigious AAPG 2017 TOTY award. I'm excited beyond words to be part of the energy and knowledge at the ACE convention," she said. "And, to be part of the 100-year celebration … is a once in a lifetime opportunity."

She is passionate about teaching geology and environmental science to her students in a balanced classroom that allows them to "discover and do science, not just take notes."

Mitchell's award includes a $6,000 prize, half allocated to Mitchell for her own personal use and the other half designated to Erie High School for educational use under Mitchell's supervision.

"Julie has been a strong leader and champion for the promotion of geology and earth science education," said Erie High School principal Matt Buchler. "She has led numerous district level teams in reviewing curriculum, adopting textbooks, and educating other science teachers and administrators about the importance of geology in the high school curriculum."

HENDRATTA ALI
Inspirational Geoscience Educator Award

Hendratta Ali, associate professor of geosciences at the Fort Hays State University (FHSU) in Hays, Kansas, has been named the recipient of this year's AAPG Inspirational Geoscience Educator Award (IGEA).

The honor, determined by the AAPG's IGEA Committee and led by chair Carol Wicks, is presented annually to a "college or university professor who has shown outstanding academic leadership and works to inspire the future of geoscience." The honor comes with a $1,000 prize from the AAPG Foundation.

"I am very humbled and honored to be selected as this year's AAPG Inspirational Geoscience Educator Award recipient," said Ali. "This is a testament to the phenomenal group of students that I have the privilege to work with, the fantastic mentors I have in my life and my supportive family.

"I have learned a lot from people I work for, my students and truly believe that we have all grown together to be better professionals. I thank the AAPG Foundation and all organizations and societies that offer opportunities and support geoscience education."

Ali has been teaching geoscience courses at FHSU since 2010 and is an active member of AAPG. In addition to teaching a wide range of geoscience courses at FHSU, Ali spends time mentoring her students outside of the classroom and encourages active participation in the geoscience community. Her students have earned eight research awards at professional conferences under her mentoring and guidance. Additionally, she was awarded "FHSU Phenomenal Woman" in 2015 for breaking gender stereotypes, taking action on campus, and leading by example.

"I can say that as an early career geoscientist, she has achieved more with her students in the last seven years than many more established geoscientists have in a lifetime," said Estella Atekwana, colleague and Regents Professor of Geology at Oklahoma State University. "She is passionate about her students, the integration of science and education, and transfer of knowledge to the younger generation (AAPG's future), including high school students in the United States and in several countries in Africa."