



# PBS-SEPM NEWSLETTER



January—February 2014

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- WTGS Luncheon Talk for February
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## Second Vice President's Column Happy New Year!

Happy New Year! Without a doubt 2013 was a great year for Permian Basin exploration, with booming activity in the many shale and unconventional plays, from Cline and Wolfcamp B in the Midland Basin to Bone Spring sands in the Delaware Basin. Not to be lost in the boom is the housing shortage region-wide and relatively high traffic volumes, though these two have spilled over from previous years into 2013 or maybe I just paid more attention to those things this compared to years past.

Now, 2013 is behind us, written into the history books, so we look forward to 2014 and with great hope, this year will be another exciting time for these plays which will continue to be developed and maintain the robust U.S. onshore production growth. Along the way,

a new play will emerge in the Basin to garner headlines, possibly a new shale play or a return to conventional reservoirs, using unconventional technologies. With a return to the conventional in mind, the first luncheon speaker for the new year will be Ned Frost, Ph.D., with the BEG. The title of Dr. Frost lecture is "New Carbonate Plays in the Mississippian Lime of the Bend Arch, Texas" in which he will present the stratigraphic framework for the carbonate facies and the disposition of chert distribution. From this point, the second half of the PBS-SEPM lecture year only gets better. Thanks to Curtis Helms, President-Elect and Luncheon Program Chairperson, we will be given a diverse line-up of lunch talks, beginning with the previously mentioned Mississippian Lime and into

Granite Wash, over to the Triassic Chinle formation in Arizona, then, we will wrap up the spring session with a deep water Delaware Basin lecture. Also, be on the lookout for core workshop date in late February or early -March as well as the Young Professionals Field Trip in June.

Again, I look forward to the new year as a clean slate for fresh ideas and a great time to be a member of the PBS-SEPM for the many programs we have to expand our understanding of the sediments around us.

*Brady Kolb*

2nd Vice President

PBS-SEPM 2013-2014

<http://www.pbs-sepm.org>

## Mark Your Calendars!

### JANUARY

- **14: WTGS Luncheon:** Harry Rowe, Ph.D. ((BEG, Austin) Chemostratigraphic Applications of Handheld X-ray Fluorescence to Several Shale Plays: Methods, Pitfalls, Limitations, Aspirations and Good Examples. (Midland Center; 11:30-1:00 PM)
- **21: PBS-SEPM Luncheon:** Ned Frost, Ph.D., (BEG); New Carbonate Plays in the Mississippian Lime of the Bend Arch Area, Texas. (Midland Center; 11:30-1:00 PM)

### FEBRUARY

- **11: WTGS Luncheon:** Lance Lambert Ph.D. (U.T. San Antonio): Insights to Permian Stratigraphy in the Delaware Basin Largely from the Ignored Patterson Hills Outcrops. (Midland Center, 11:30-1:00 PM)
- **18: PBS-SEPM Luncheon:** Stephanie W. Noonan, (OXY) Lithofacies, Depositional Environments, & Sequence Stratigraphy of the Pennsylvanian Marble Falls Formation, Central Texas", Midland Center; 11:30-1:00 PM)

### MARCH

- **11: WTGS Luncheon:** Rick Fritz, et al. (SM Energy): "The Geology of the Arbuckle Group in the Mid-Continent: Sequence Stratigraphy, Reservoir Development and potential for Hydrocarbon Exploration". (Midland Center; 11:30-1:00 PM)
- **18: PBS-SEPM Luncheon:** Ed LoCicchio (Atlas Exploration, topic is Granite Wash, title TBA. (Midland Center; 11:30-1:00 PM)

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Do you have an idea for an interesting luncheon talk? Have a core workshop you'd like to present? Have some suggestions on how PBS-SEPM can better serve the geologic community? Just click on the e-mail above & drop us a note, your PBS-SEPM Executive Board would love to hear from you!



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*"Science is facts; just as houses are made of stone, so is science made of facts; but a pile of stones is not a house, and a collection of facts is not necessarily science."*

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*-Jules Henri Poincaré (1854-1912)*

## PBS-SEPM Luncheon Talk –January

**Ned Frost, Ph.D.**

### *“New Carbonate Plays in the Mississippian Lime of the Bend Arch Area, Texas”*

*Bureau of Economic Geology, Jackson School of Geosciences, The University of Texas at Austin*

Tuesday, January 21, 2014 - Midland Center, 11:30 a.m.

#### **Abstract**

A new drilling campaign is currently underway to assess the potential of the “Mississippian Lime” (Chapel Formation) of the Bend Arch area of Texas. Traditionally Waulsortian mounds were targeted in this area; whereas, new drilling targets porous and often silica-rich, outer-ramp and inter-mound strata for oil production. Based on six continuous cores and well logs from Shackelford, Stevens, Young, and Throckmorton counties this study aims to (1) delineate the facies patterns and stratigraphic architecture of the Miss Lime, and (2) characterize the origin and distribution of chert.

Within the Mississippian section two distinct stratigraphic units are recognized, referred to herein informally as the M1 and M2 sequences. The M1 sequence, traditionally referred to as the Chapel Formation unconformably overlies the Ellenberger Formation, the upper portion of which is often limestone within the study area. The M1 sequence begins with a succession of argillaceous crinoidal floatstones and lime mudstones which grade upward into a progradational package of crinoid and bryozoan rich rudstones and grainstones. Waulsortian Mounds are common within the M1 sequence and are best developed in mid-to outer-ramp settings. The M1 sequence tapers basinward and transitions from grain-dominated to increasingly mud-dominated fabrics from updip to downdip. The M2 sequence begins with a landward-tapering package of skeletal-peloidal grainstones and packstones, and spiculitic lime mudstones. The M2 lime unit also transitions from grain-dominated fabrics updip to mud-dominated fabrics downdip. The M2 limestones grade upward into the Barnett Shale. The best reservoir potential exists where porous skeletal-peloidal grainstones and packstones are juxtaposed directly adjacent to the Barnett Shale.

Chert is interpreted to have formed early in the Miss Lime, and is strongly correlated with the presence of sponge spicules and inversely correlated with early-cementation trends. As such, there is a spatial control on chert, which is best developed in mud-dominated, spicule-rich, strata of the middle-to outer-ramp. Chert is absent in the Waulsortian mounds, and rare in grain-dominated crinoidal facies. Chert distribution is also temporally restricted, and is best developed bracketing the M1-M2 boundary. The stratal architecture and silica distribution described here strongly resemble the Lake Valley Formation in Sacramento Mountains of New Mexico. Whereas, the similarities between the Chapel system and Mississippian “cherts” of Oklahoma are less compelling and caution is needed when comparing these two systems.

#### **Biography**

**Ned Frost** is a carbonate sedimentologist and stratigrapher for State of Texas Advanced Resource Recovery (STARR) group at the Bureau of Economic Geology in Austin Texas. Ned received geology degrees from the University of Colorado (B.S., 1998) and The University of Texas at Austin (Ph.D., 2007).



Prior to joining the BEG in 2011, Ned worked for ConocoPhillips in their Sub-surface Technology group. Ned's research interests are broadly focused on the interaction of structural deformation, carbonate depositional processes, and diagenesis. Ned has worked on a broad array of subsurface and outcrop projects including: the Devonian of the Canning Basin, the Mississippian of the Fort Worth Basin and Sacramento Mountains, the Carboniferous of the Precaspian Basin (Kashagan) and the North Slope (Lisburne), multiple projects in the Permian Basin and Guadalupe Mountains, as well as the Cretaceous of South Texas.

*"Most  
institutions  
demand  
unqualified  
faith; but the  
institution of  
science  
makes  
skepticism  
a virtue."*

*Robert K. Merton,*

*1957, Social Theory*

*"My own view  
is that it's  
easy to find  
oil. It's hell  
to make  
money"*

*Marlan Downey, 1991,  
quoted in Steinmetz 1992,  
back cover). "*

**PBS-SEPM 2014 Calendars are in!**



## **Permian Basin Section-SEPM Calendar**

The calendars are now available in the WTGS office. The price is \$15.00 each or can be purchased at a special volume discount: "Buy 5, get 1 free".

For additional information contact: PBS-SEPM Office (432) 683-1573 or email [wtgs@wtgs.org](mailto:wtgs@wtgs.org)

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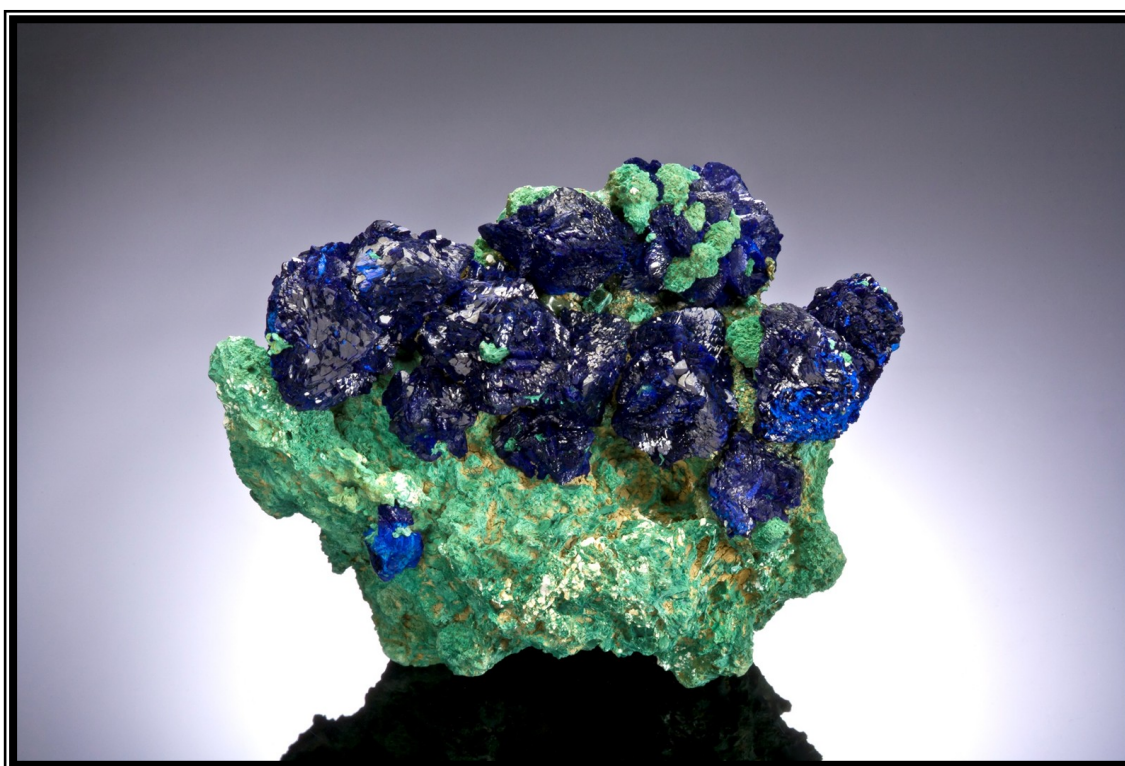
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## PBS-SEPM 2014 Calendar



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***"..When times get tough there is a lower margin for error, therefore we should be putting more geoscience into understanding plays, not less, i.e., if you're going to develop a play in tough economic times, it's best to know as much as possible about it in order to minimize the amount of money spent unproductively."***

Kirk Campion  
2009

**PBS-SEPM is the Permian Basin Section of SEPM—the Society for Sedimentary Geology. However, you do not need to be a SEPM member or a geologist to join PBS-SEPM.**

**Our non-profit society relies upon the efforts of dedicated volunteers to serve the geological community—primarily through educational events. These events include monthly luncheon talks, core workshops, annual field trips, and special geological publications. Additionally, we are involved on the college campuses—reaching out to future earth scientists through scholarships, discounted memberships, and offering full-time geology students the ability to participate in professional-grade field trips at little to no cost.**

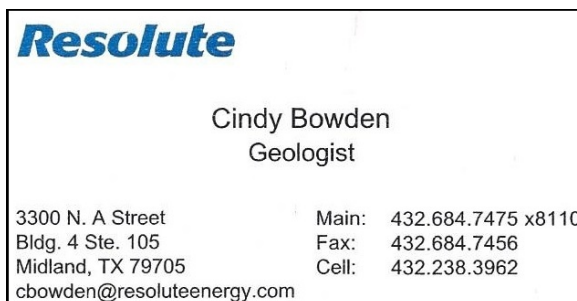
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Your card will be in every newsletter for one year June to May, on the Website, the Power Point shown prior to every luncheon and in the calendar credits.



***"The beginning of wisdom is found in doubting; by doubting we come to the question, and by seeking we may come upon the truth."***

*Pierre Abelard (1079-1142)  
French scholastic philosopher, theologian.*

## PBS-SEPM Luncheon Talk –February

**Stephanie G. Wood Noonan**

### *Lithofacies, Depositional Environments and Sequence Stratigraphy of the Pennsylvanian (Morrowan-Atokan) Marble Falls Formation, Central Texas*

*Occidental Petroleum, Houston, Tx*

Tuesday, February 18, 2014 - Midland Center, 11:30 a.m.

#### **Abstract**

The Pennsylvanian Marble Falls Formation in the Llano Uplift region of the southern Fort Worth Basin (Central Texas) is a Morrowan-Atokan mixed carbonate-siliciclastic unit deposited in the Fort Worth Basin. Previous interpretations of the Marble Falls Formation have only come from outcrop studies at the fringes of the Llano Uplift, making it difficult to have comprehensive understanding of the complete section and regional stratigraphy. A series of 20 cores were described and correlated to create a facies architectural model, depositional environment interpretation, and regional sequence stratigraphic framework. On the basis of core data, the study area is interpreted to have been deposited on a ramp setting with a shallower water upper ramp area to the south and a deeper water basin setting to the north. Analysis of cores and thin sections identified 14 inner ramp to basin facies. Dominant facies are: (1) argillaceous, burrowed spiculitic wackestone and packstone (2) algal grain-dominated packstone to grainstone (3) skeletal foraminiferal wackestone and (4) argillaceous mudstone to clay shale. Other facies also present include conglomeratic wackestone and green illite claystone.

Facies stacking patterns were correlated and combined with chemostratigraphic data to improve interpretations of the unit's depositional history and form an integrated regional model. The Marble Falls section was deposited during Pennsylvanian icehouse times in a region forming horst and graben systems in response to the Ouachita Orogeny. The resulting depositional cycles reflect high-frequency sea-level fluctuations and are divided into 3 sequences. Sequence 1 represents aggradational ramp deposition truncated by a major glacioeustatic sea-level fall near the Morrowan-Atokan boundary (SB1). This fall increased accommodation downdip in previously distal areas for carbonate HST deposition following a short TST phase in Sequence 2. Sequence 3 represents the final phase of carbonate accumulation that was diachronously drowned by Smithwick siliciclastics enhanced by horst and graben faulting.

These findings contribute to our understanding of the depositional response to glacioeustatic sea-level changes during the Pennsylvanian and can also form the basis for constructing a sedimentological and facies analog for Morrowan to Atokan shallow- to deepwater carbonates in the Permian Basin and the northern Fort Worth Basin.

#### **Biography**

**Stephanie Wood Noonan** Stephanie Wood Noonan is from Liberty, Texas and graduated from Liberty High School. She attended Texas A&M University in College Station and completed an undergraduate honors thesis. After graduating with Bachelor of Science in 2011, she began her Master's work on the Marble Falls Formation at the University of Texas at Austin. At U.T., she worked as a research assistant for the Reservoir Characterization Research Laboratory (RCRL) at the Bureau of Economic Geology (BEG) at the Jackson School of Geosciences. Stephanie also worked as a teaching assistant in the spring of 2013 for the Introduction to Field Methods and Stratigraphy undergraduate course. Stephanie completed her Master of Science degree in August of 2013 and was married in October. She began working in Houston, TX for Occidental Petroleum in November and is currently a geologist for the Oxy Wolfberry Reservoir Management Team.

*“Science can only ascertain what **is**, but not what **should be**, and outside of its domain value judgments of all kinds remain necessary”*

**Albert Einstein**  
(1879-1955)

U.S. Physicist,  
born in Germany

*“Truth in science can be defined as the working hypothesis best suited to open the way to the next better one”*

**Konrad  
(Zacharias)  
Lorenz**  
(1903-1989)

Austrian Ethnologist  
Nobel Prize for  
Medicine in 1973