

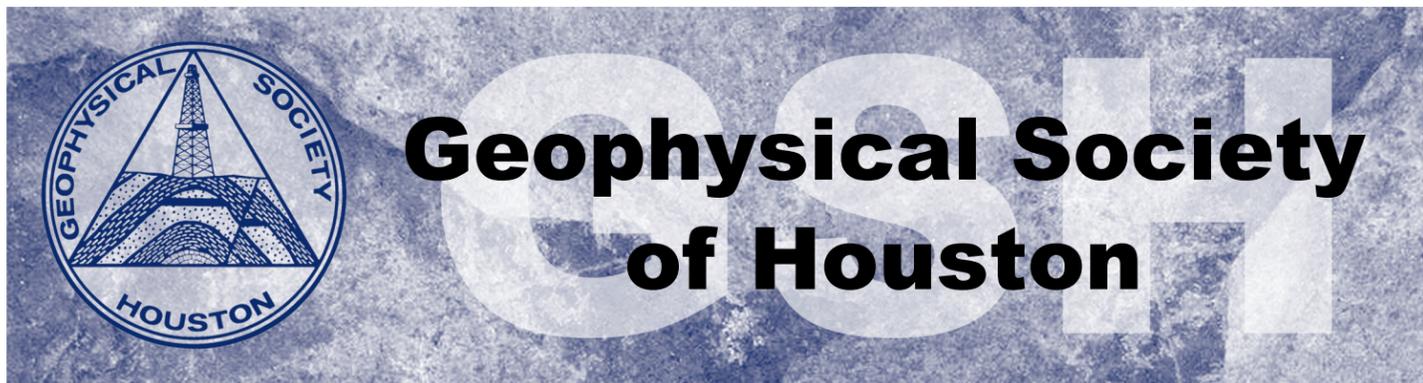
SEPTEMBER 2003

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
	1	2	3	4	5	6
7	8	9	10 Technical Breakfast	11 GSH Board	12	13
14	15 Technical Luncheon	16	17 Processing SIG	18 Potential Field SIG	19	20
21	22	23	24 Auxiliary Rock Physics SIG	25	26	27
28	29	30	31			

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VOL. 38, NO. 2

NEWSLETTER

SEPTEMBER 2003

Technical Luncheon

Date: Tuesday, September 16, 2003

Time: 11:30 AM

Location:
Hess Building
5430 Westheimer, Houston

Cost: \$22 w/reservation
\$27 at the door

Reservations:
GSH 713/463-9477
Email: joan@hgs.org
(Reservations are encouraged)

Title: RECENT ADVANCES
AND FUTURE
CHALLENGES IN
GEOPRESSURE
PREDICTION

Speaker:
Alan R. Huffman
Fusion Geophysical



Abstract:
Pre-drill pressure prediction using geophysical data and methods has historically been done using very simple models and has been restricted by overly simplistic estimates of the Earth's velocity field. The methods used have usually been a locally calibrated set of curves for

Technical Luncheon continued on page 10.

Technical Breakfast

Date: Wednesday,
September 10, 2003

Time: 7:00 am, Breakfast will be served in the lobby
7:30 am, Presentation in the iVision room (Food is not be allowed in the iVision room)

Location:
Schlumberger, Houston
Solutions Center
1325 South Dairy Ashford
Houston, 77077

Reservations:
GSH 713-463-9477
email joan@hgs.org

Reservations are recommended for this event so Schlumberger can prepare Visitor card keys for those attending. Walkups can be handled, but check in will go faster for everyone if there is a list covering most of the guests.

Contact:
John F. Parrish at
281-300-2570 or email
GSHTechB@periseis.com

Speaker: David Paddock

Title: 3D Seismic Classification - An efficient approach for prospect identification in asset evaluation by Fangjian Xue, Rolf Broetz, David Paddock and Kim Hemsley, Schlumberger Solutions Center

Technical Breakfast continued on page 4.

President's Column

Newsy Newsletters
L. C. (Lee) Lawyer, Editor

This is the same heading I used exactly one year ago. John Sumner (Assistant Editor) and I had grandiose plans to convert the Newsletter into an entertaining publication. Somehow, with the press of getting all of the announcements properly printed, we came up short. There is a problem. If you add pages to the Newsletter, it must be in numbers divisible by four. I can't add two pages even though I only have enough material for two. It is four or nothing. Since pages cost money, we scrimp. Many issues are eight pages. Most are twelve. An election issue can get up to 16.

Last year, I asked the question, "Are we getting all we want from our newsletter?" We have announcements with dates, times and places. No jokes. No crossword puzzles. No comics. We have the President's Column but apart from that there is little editorial content or comment. Now and then a speaker's abstract may lean toward a heavy subject, but that is very infrequent. Occasionally, we have a report on a sponsored event, such as the Saltwater Fishing Tournament or the Sporting Clays. A picture shows up now and then. I hope you liked the pictures last year. I decided not to put names under them because of the high probability of error. We will continue to have as many as possible. Plus, they are good fillers.

President's Column continued on page 5.

Dues are Due,
Re-up Now!

INSIDE THIS ISSUE

Tennis Announcement	3	Processing SIG	6
Membership Report	3	Rock Physics SIG	7
Auxiliary	4	UT Dallas	10
Sporting Clays	5	Obituary	10
Potential Fields SIG	6	SEG Annual Meeting	11

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SEG Dallas 2003

International Exposition and Seventy-Third Annual Meeting ★ Dallas, TX ★ Oct. 26-31, 2003

Join an estimated 8,000 attendees in Dallas in exploring "Geophysics—An International Language" with the latest technologies and methods. Survey more than 700 technical presentations and approximately 300 exhibitors with more than 200,000 sq. ft. of state-of-the-art products and services at the world's largest marketplace for the geophysical industry.



Dalton Boutte



Steven Farris



Peter Gaffney



John Gibson



Raoul Restucci



Peter Rose



Bob Tippee

Learn about the future of energy exploration from influential oil-industry executives and analysts!

The SEG Annual Meeting is pleased to feature the —
TLE Forum IV: The future of the upstream oil & gas industry

This year's forum will feature senior oil-industry executives and analysts:

- **Dalton Boutte**, President of *WesternGeco*
- **Steven Farris**, President & CEO of *Apache Corporation*
- **Peter Gaffney**, Gaffney & Cline, former President of *SPE* and International Consultant
- **John Gibson**, President and CEO, *Halliburton Energy Services Group*
- **Raoul Restucci**, CEO, *Shell E&P Americas*
- **Peter Rose**, Senior Partner of *Rose & Associates*, Geologic Risk Analysis Consultant
- **Bob Tippee**, Editor of the *Oil & Gas Journal* and one of the most knowledgeable journalists in the world about the industry, will be the moderator

Attention students of all ages ➤

Find out what space looks like to a geoscientist. Astronaut **James F. Reilly II**, who has a Ph.D. in geoscience and is a former Chief Geologist of the Offshore Region for *Enserch Exploration*, will describe his nine years in the U.S. space program, which includes two orbital missions and three spacewalks.



James F. Reilly II

Advance Registration
 July 1 thru September 22, 2003

Housing Reservation
 July 1 thru September 22, 2003

For more information or to receive a 2003 SEG/Dallas Annual Meeting Announcement, contact:
Tel +1-918-497-5500
Fax +1-918-497-5557email: meetings@seg.org

Visit our Web site for more information:

www.seg.org

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SEG DALLAS 2003

SEG International Exposition and Seventy-Third Annual Meeting
 Dallas, Texas • October 26-31, 2003



SEG Society of Exploration Geophysicists

pressure that had imbedded in them assumptions about the cause of pressure in the geological section that the control wells came from. The advent of the effective stress concept and the pressure prediction methods that developed from that concept led to a much-needed inclusion of fundamental physics into the art of pressure prediction. The range of software available for pressure prediction has grown significantly in recent years, and the sophistication of the parameters used has also increased. Still, the biggest weaknesses of the method are the limitations of the seismic velocities themselves and the lack of understanding of the basic causes of pressure and their effects on physical properties, including velocity, density and porosity, of the rocks that we penetrate with the drill bit.

Biography:

Dr. Alan R. Huffman is a recognized technical and business leader in the petroleum industry with over 20 years of experience in Geosciences. His expertise includes direct detection of

hydrocarbons, geopressure prediction, advanced imaging methods, physical properties analysis, rock physics, geological hazard analysis and the mechanics of high-strain-rate deformation of geologic materials. He received a Bachelors degree in Geology from Franklin and Marshall College in 1983, and a Ph.D. in Geophysics from Texas A&M University in 1990. His main research focus was rock physics and mechanics and crustal seismology. His doctoral research on shock deformation of silicates led to numerous publications and to his being recognized as a leading expert in the area of high strain rate deformation of natural materials. Huffman is active in industry and professional affairs, having chaired numerous technical conferences and having served on organizing committees for the SEG, AAPG, AAGP and SPE. He is a member of the SEG, AAPG, AEG, GSA and AGU. He teaches geophysical technology schools in the petroleum industry, and has presented lectures and seminars at several universities.

As the Vice President of Operations for Fusion Geophysical LLC, he is responsible for the daily operations and all service projects performed by the company. Dr. Huffman also designs and implements the marketing and technology strategy for the company's products and services, and acts as the primary liaison with customers and alliance partners. Dr. Huffman is also the President & CEO of Fusion Petroleum Technologies Inc., the Texas operating subsidiary of Fusion Geophysical LLC.

Before joining Fusion in 2002, Huffman held the title of Manager of The Seismic Imaging Technology Center (SITC) with Conoco from 1997-2002. From 1990 to 1997, Huffman was employed by Exxon Corporation. Huffman was actively involved in the exploration and field development process from the acquisition of 3D seismic, to final interpretation, and to the planning and drilling of wells in the United States, The Far East, West Africa and Russia. He worked a wide variety of projects from regional exploration studies to detailed field and reservoir scale projects.

Editor's Note

To insure your information reaches the GSH society members in a timely manner it must appear in the appropriate newsletter issue. Please note the following deadlines and plan your function's publicity strategy accordingly. Items must be received on or before the corresponding deadline date. Materials can be sent to Lee Lawyer at lawyer@prodigy.net with a cc to John Sumner at john.r.sumner@exxonmobil.com. If you have any questions please call Lee Lawyer at 281/531/5347 or John Sumner at 713/431/6796.

2003 GSH Newsletter Deadlines

Issue October 2003
Deadline..... September 9, 2003

Issue November 2003
Deadline..... October 9, 2003

Issue December 2003
Deadline..... November 11, 2003

Announcements

Technical Breakfast
September 10, 2003

Technical Luncheon
September 16, 2003

PROCESSING SIG
September 17, 2003

POTENTIAL FIELDS SIG
September 18, 2003

ROCK PHYSICS SIG
September 24, 2003

SPORTING CLAYS
October 16, 2003

2003 GSH TENNIS TOURNAMENT

FRIDAY, OCTOBER 3, 2003 at 12:00 NOON

\$30 per Entrant
Chancellors Racquet Club
6535 Dumfries
Houston 77096

Play will began promptly at 1:00 p.m. and conclude by 5:00 p.m. Lunch will be served at 11:30 a.m. Cold drinks will be available and we will have a keg for the COOLING DOWN TIME.

This will be a half day A and B Scramble Tournament. A player will play with all other players in his group. Ladies will be teamed with partners in the A or B groups as they choose. In addition to TROPHIES there will be a drawing for a generous group of DOOR PRIZES.

To ensure the proper amount of court space, food and drinks, complete and send in the entry form as soon as possible, but no later than September 24, 2003. We have more room for players and encourage you to contact your associates to participate in the tournament. We are again inviting players in the Geological Society to join us so as to have more players and more fun.

For more information call

Joe Jones 281/438-5626 or Lee Lawyer 281/531-5347
email mhooninvhjj.com@worldnet.att.net or llawyer@prodigy.net

2003 GSH TENNIS TOURNAMENT ENTRY FORM

NAME _____
Phone No. _____ Company _____
Flight Preferred: A _____ B _____ Ladies _____

Make Checks Payable to: GSH Tennis Tournament
MAIL TO: Joe Jones, 3802 Pecan Valley Drive, Missouri City, TX 77459

Membership Report

The following report shows the new members to the GSH. Approximately 400 members have not renewed. Please renew now! If you have any questions, please call the GSH staff office at 713/463-9477.

New Members ~ Active

Michael C. Allison	Graham R. Johnson
Richard H. Arnold	Irfan Tanritanir
Mike W. Edwards	Harvey D. Wilson

Associate

Hiroshi Chiba	Jonathon Hochberg
---------------	-------------------



Reservations
Make reservations by e-mail at joan@hgs.org and include your member number (found on Bulletin mailing label).
Call 713/463-9477 Fax (713) 463-9160

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Information Sessions

Galleria area - Oct. 15, 2003
Woodlands - Oct. 16, 2003

To register, call 972-883-2373
or visit us online

<http://glemba.utdallas.edu>

OBITUARY

CHARLES G. HEIL of Montgomery, TX passed away August 6, 2003. He was born March 20, 1928, in Mercedes, TX to Herman Heil and Wilma Vollers Heil, both who preceded him in death. He served in the Navy during WWII. He received a degree in Geology from the University of Texas in 1951. Heil was employed by Conoco for 37 Years. He is survived by his wife of 55 years, Shirley J. Heil; his children: Keith Heil and wife Rebecca of Edmond, OK; and Janice Heil Chilton from Trophy Club, Texas and husband Gregg; and 8 grandchildren. He is also survived by one brother Allen Heil of Galveston, TX; and his 3 children. Funeral Services were held Saturday, August 9, 2003 at Forest Park The Woodlands Chapel at 1:00 PM with Rev. John Bentley officiating. Interment was at Forest Park The Woodlands Cemetery.

Join the Geophysical Auxiliary of Houston for a Year of Exciting Events!

The Geophysical Auxiliary of Houston invites the wife of any present or past member of the GSH or SEG, the widows of former members of the GSH and SEG and women members of these organizations to join us for our 2003-2004 year.

Many wonderful events are being planned for 2003-2004 and we invite you to join us! Sign up now so you can start receiving our newsletter and not miss a single event.

The year will begin on September 24 with a tour of the "Forbidden Gardens" followed by a Chinese buffet luncheon at a nearby restaurant. Forbidden Gardens, in Katy, Texas is a fascinating outdoor museum replicating some of China's major historic scenes. Guided tours take you back to the third century BC to view the first Emperor's amazing 6,000 piece terra-cotta army replicated in 1/3 scale. The tour continues to the intricately detailed miniatures of the famous Forbidden City in Beijing which served as palaces for nearly 500 years of Imperial rule. Come and experience the mystery and magic of Imperial China. Forbidden Gardens is a must-see for everyone who wants to embark on an unforgettable journey to a faraway land without stepping outside of Texas.

Our next event, to be held Thursday November 13, will be a luncheon at the Houston Racquet Club. Join us as we welcome Valerie Koehler from Blue Willow Books, who will tell us all about the latest and greatest books for our reading enjoyment or for us to give as gifts for the upcoming holidays.

The following ladies are serving as officers and committee chairpersons for the 2003-2004 year: Carol Gafford, Nan Pye, Donna Parrish, Mary Elizabeth Sims, Betty Conroy, Emilie Fulton, Georgeann Massell, Phyllis Winborn, Ruth Harrison, Pat Abercrombie, Kathi Hilterman, Lynn Schoenberger, and Luann Cefola.

Please join us as we look forward to a year of entertaining, enjoyable and enlightening programs. Yearly dues are only \$15.00. Call Membership Chairperson, Donna Parrish at 281-859-8088, GSH Liaison, Luann Cefola at 281-759-7338, or President, Carol Gafford, at 281-370-3264 for a membership application and information on how to join.

Technical Breakfast continued from page 1.

Summary:

3D seismic classification is a breakthrough emerging technology to determine 3D distribution of pore fluid and lithology from multiple, seismic attribute volumes. This technique provides an innovative, time-saving solution in identification and definition of prospective targets, especially in areas with multiple pay zones and complex geology. A 3D seismic classification analysis performed on the productive Miocene trend of the Gulf Coast has revealed numerous prospective targets adjacent to and below existing fields. A supervised classification method was used to define classes of fluid and lithofacies based on knowledge of well production, lithology and seismic attributes. These classes include bright-spot gas sand, bright-spot oil sand, bright-spot wet sand, dim-spot oil sand, dim-spot wet sand and shale. Five seismic attribute cubes were used as input for the classification: conventional seismic, acoustic impedance, reflection strength, instantaneous frequency, and Volume Reflection Spectrum. Using cross-plot discriminant analysis, extra classes were

defined based on their cluster distribution, separating classes based on their degree of risk. The generated class cubes provide the location of prospective targets and the associated probability cubes provide quantitative estimation of risk. 3D visualization techniques vividly display the distribution of fluid and lithofacies and also provide the volume-percentages of different classes, which is important for quality control. Compared with current seismic interpretation and classification techniques, this technology reduces cycle time and results in more accurate risk assessment. Exploration targets can be more quickly and systematically identified to optimize E&P activities.

Biography:

Dave Paddock is the Lead Geophysicist for Schlumberger's DCS Consulting Services group in Schlumberger's Houston Solutions Center. Dave has worked there since 2000 on projects in the proto-Caspian and the Texas and Louisiana Gulf Coast (onshore and offshore) requiring seismic reservoir characterization. Dave's interests are primarily in the prediction of petrophysical

properties and the classification of seismic data using multiple seismic attributes, including trace shape, variance, inversion, and conventional attributes. Previously, Dave was with ARCO and Vastar in their Midland and Lafayette offices, serving in exploration, exploration computing, and development roles, where he generated over 20 TCFE of prospects, discovered 8 fields, and performed reservoir geophysics for development drilling programs with up to 7 rigs running simultaneously.

Dave was elected as a Co-Leader of Schlumberger's 400-member Geophysical Interpretation Special Interest Group for 2003 - 2004 and has received Schlumberger's Silver Medal (with his teammates) for an Austin Chalk reservoir characterization project.

Dave earned a bachelor of science degree in mathematics and a master of science degree in geology with a geophysics option from Michigan State University and holds an MBA from the University of Louisiana at Lafayette.

Potential Fields continued from page 8

Frequently Asked Questions About Gravity Gradiometry

Manik Talwani, Rice University

Answers to the following questions regarding gravity gradiometry will be given:

Are gradients only useful for detecting shallow objects, since gradient values fall off as the cube of the distance? Can they be used to detect deep objects?

Given that gravity and gravity gradients are both derived from the identical gravity potential, what is the benefit of one kind of measurement over the other?

Is it sensible to measure gradients from satellites?

Is the vertical gradient all that is needed? Should the other components also be measured? Should all the components be combined in a joint inversion?

Do the horizontal gradients Unz and Uez define the north and east edges of the causative body? Does the gradient Une define the corners of the body?

What are invariants? Are they important?

How are gravity gradients measured and which are the best available gradiometers?

Are gradiometers absolute instruments?

Biography:

Manik Talwani holds the Schlumberger chair for Advanced Studies and Research at Rice University in Houston. For the past few years his research has focused on gravity gradiometry.

Processing SIG continued from page 6

the early diagenetic history of a platform (e.g., subaerial exposure at sequence boundaries). Pore systems are complex and record both depositional and diagenetic controls. Outcrop dimensional data, and forward seismic models help to quantitatively populate geometrically constrained stratigraphic models, and validate seismic predictions of stratigraphy and lithofacies.

The sequence framework also provides constraints for geologic modeling in exploration and production settings. The introduction of 3-D seismic, seismic attributes (e. g., amplitude, frequency, phase), and visualization technology integrated with rock physics, core, and outcrop lithofacies dimensions provide new opportunities to delineate meter to decimeter-scale stratigraphy. Attribute and seismic facies can be mapped in 3-D volumes and provide spatial distributions of individual stratal bodies. Low impedance

contrasts within platforms can be due to subtle porosity changes and are detectable with seismic inversion.

Efforts to significantly improve seismic imaging of carbonate sequences are critical to any advances in the area of volume and attribute interpretation. The unique aspects of carbonates, including high impedance, low impedance contrasts within platform successions, lack of bedding and complex pore systems in reefal lithofacies, the potential for steep depositional slopes, and the chaotic character of karsted terrain's all can potentially diminish seismic quality and resolution. The intimate association with mobile evaporites in many basins produces complex structures and steep dips that present challenges to seismic acquisition and processing. Carbonates are commonly interbedded with siliciclastics that have much lower impedance, resulting in a strong susceptibility for multiple generation.

Biography:

J.F. 'Rick' Sarg – currently Stratigraphy Coordinator, ExxonMobil Exploration Co. Ph.D., Geology, University of Wisconsin, Madison, 1976. MS (1971) and BS (1969) in Geology, University of Pittsburgh, Pittsburgh, PA. Twenty-six years petroleum exploration and production experience in research, supervisory, and operational assignments with Mobil (1976), Exxon (1976-90), Independent Consultant (1990-92), Mobil Technology Company (1992-99) where attained position of research scientist, and now ExxonMobil Exploration (2000-present). Member of exploration research group at Exxon that developed sequence stratigraphy, with an emphasis on carbonate sequence concepts. Worldwide experience in integrated seismic-well-outcrop interpretation of siliciclastic and carbonate sequences. Authored or co-authored 28 papers on carbonate sedimentology and stratigraphy.

SPECIAL INTEREST GROUPS

Potential Fields continued from page 7

Airborne Full Tensor Gradiometry: A method for refining geological and geophysical models

Gary W. Coburn*, and Gary Mumaw, Bell Geospace, Inc

Summary

The gravity field is a vector composed of three components, Gz, Gy and Gx. The first spatial derivative of this vector forms the gravity gradient tensor, which consists of nine components (e.g., Gxx, Gxy, Gxz, etc) of which only five are independent. Conventional airborne gravity surveys measure only the vertical component Gz while gravity gradiometry measures the components of gradient tensor. Some airborne gradiometers in service today measure only two ((Gyy-Gxx) and Gyx) components while the Full Tensor Gradiometer (FTG) measures all five independent components. In order to define the edges and shapes of anomalous geologic bodies, such as salt or ore bodies; it is necessary to measure all the components of the gradient tensor. These data are used to constrain the geological and geophysical model on a prospect level by defining the edges and shape of the body as well as refining the density layers of the model.

Airborne Full Tensor Gravity Gradient (FTG) data compares very favorably with conventional land gravity data. Airborne Full Tensor Gravity Gradient (FTG) data can fill in gaps in land gravity surveys and be incorporated into the overall analysis very quickly and when properly processed and interpreted can substantially improve the density/geologic model in difficult seismic areas on a prospect level. This improved geologic/density model can be successfully incorporated into both the seismic interpretation as well as the seismic processing workflow. Incorporating the density model derived from this process improves the interval velocity model.

Biographies

Gary W. Coburn is currently Geoscience Manager for Bell Geospace, Inc. Prior to joining Bell in 1997, he spent 20 years in petroleum exploration and production with a number of major and independent oil companies (CNG, Superior, Tenneco, Chevron and Tatham Offshore). During that time, he gained considerable experience in onshore and offshore provinces, including the deepwater Gulf of Mexico. Coburn earned his BS degree in geology from the University of North Carolina. He is a member of SEG, AAPG, SPWLA, HGS and GSH.

Gary Mumaw is Senior Geoscientist at Bell Geospace Ltd / EAME in Aberdeen, Scotland since 1998. Prior to joining Bell, he spent over 20 years as an exploration geophysicist in Domestic US and International exploration activity in both staff and consulting roles within a variety of operating companies including Gulf Oil, Aramco, Britoil, Van Dyke Energy, Arco Indonesia, and TFE. Gary holds a BS (74) in Geophysics from Wright State University; an MS (94) in Environmental Engineering from Strathclyde University; and active membership of the SEG since 1974.

Potential Fields continued on page 9.



GSH Executive Officers

Front row, left to right:
Lee Lawyer, Roy Clark
and Steve Danbom

Second row, Left to right:
Mike Mueller, Chris Ross,
Peter Wang and Keith Matthews

18th Annual GSH Sporting Clays Tournament



Saturday, October 18, 2003

American Shooting Centers
16500 Westheimer Pkwy.

This year's Sporting Clays Tournament will be held on Saturday, October 18th, at the American Shooting Centers. The tournament is an all day event and family participation is encouraged. Non-GSH members are welcome.

The tournament is a 50 bird event, designed to simulate actual field conditions. Shells are provided, however **you must bring eye and ear protection**. Prizes will be awarded for shooting prowess in various levels of expertise.

BBQ lunch and refreshments are provided throughout the day. Door prizes (made possible through corporate and private sponsorship) will be awarded after the conclusion of shooting.

Please ask your company to help sponsor this annual event. It is through the sponsor donations that we are able to have such good door prizes each year. Feel free to call me if you have questions, or pass my name on other interested persons.

For more information, contact: Tom McCarroll at (832) 366-1623 ext. 205 or tmccarroll@cheypet.com.

GSH SPORTING CLAYS REGISTRATION FORM

Name: _____ Company: _____

Address: _____

Email: _____ Phone: _____

Preferred shooting time: (circle one) 9:00 10:45 12:30

Indicate ammunition required: (circle one) 12 gauge 20 gauge

Please return form(s) with check for \$60.00 per shooter, payable to: **Geophysical Society of Houston**
Mail to: **Noirin Taber, Cheyenne Petroleum, 1221 Lamar St #1301, Houston TX 77010**

Registration Fee: \$ _____ + Sponsor Contribution: \$ _____ = Total: \$ _____

If you wish to shoot with a specific squad (5 shooters max.), please submit all forms together.

DISCLAIMER:

I acknowledge that neither the Geophysical Society of Houston nor the American Shooting Centers will be held responsible for injury or accidents during this event. PRACTICE SAFETY!!

Signature: _____

President's Column continued from page 1.

But where are those letters to the Editor that I asked for a year ago? I turn to the Signals portion of TLE first. I am frequently disappointed to find that there are no letters from the readers. The TLE's problem is the same as ours. Why would anyone want to comment on the date of the Technical Luncheon? Or a triple integral?

How about registering geophysicists? Doesn't that make your blood boil? One needs to get worked up and get emotional to write a

letter to the Editor. You need to complain about something. An example from last year was the color of the masthead. That controversy raged for a couple of weeks and then died down. I attended a planning session with the current SEG Excom and the Excom-elect a few weeks ago. We "brain stormed" the major issues facing the SEG. I have to tell you that the storm (brain) did not cause any tsunamis! There was hardly a ripple. I am trying to write a column about the meeting but I think

I have forgotten what we decided. Maybe the GSH should have a planning meeting and brainstorm our problems.

We will have several guest (guest not ghost) writers for the President's column. Each of the Excom will be offered an opportunity to expound on whatever comes to mind. If you have any (polite) suggestions for the GSH Board let us know. Both John and I look forward to another great year. Pulitzer here we come.

SPECIAL INTEREST GROUPS

The Potential Fields Special Interest Group

of the Geophysical Society of Houston is proud to present:

An Evening with Gravity Gradiometry

(A Mini-Symposium)

UNDERSTANDING GRAVITY GRADIENTS (Poster Presentation)

by **Afif H. Saad***, **Saad GeoConsulting**

AIRBORNE FULL TENSOR GRADIOMETRY: A METHOD FOR REFINING GEOLOGICAL AND GEOPHYSICAL MODELS

by **Gary W. Coburn*** and **Gary Mumaw**, **Bell Geospace, Inc**

FREQUENTLY ASKED QUESTIONS ABOUT GRAVITY GRADIOMETRY

by **Manik Talwani***, **Rice University**

* Speakers

Date: Thursday September 18, 2003

Time: 5:30 Social Hour; 6:30 Dinner; 7:30 Presentation

Location: HESS Building, 5430 Westheimer, Houston

Cost: \$25.00 (\$30.00 for Late or No Reservations)

Contact: **Afif Saad, Chair** - GSH Potential Fields Group, at **281-342-8575** (AfifHSaad@netscape.net or AfifHSaad@hssoa.com) or **Bob Van Nieuwenhuise**, Co-Chair at 281-391-6444 Ext.229 (BobVearthwave@aol.com) by Tuesday, September 16, 2003 for reservations. E-mail is best because we can confirm your reservation. Please HONOR your reservation! We must bill no-shows!

Potential Fields continued on page 7.

Processing SIG

Date: Wednesday,
September 17, 2003

Time: 4:30 pm Social
5:00 pm Presentation

Location: Core Laboratories
6316 Windfern
Houston, TX 77040
713-328-2673

Reservations: GSH 713-463-9477

Questions: Karl Seibert
Core Lab
RTD Seismic
Processing Division
713-328-2673

Title: Integrated Seismic Analysis of Carbonate Reservoirs: From the Framework to the Volume Attributes

Speaker: J.F. 'Rick' Sarg – Stratigraphy Coordinator, ExxonMobil Exploration Co.

Integrated Seismic Analysis of Carbonate Reservoirs: From the Framework to the Volume Attributes

J. F. "Rick" Sarg, ExxonMobil Exploration Company, Houston; and James S. Schuelke, ExxonMobil Upstream Research Co., Houston

Summary

The recognition of the significance of seismic geometries and the depositional sequence concepts derived from them has

revolutionized carbonate stratigraphy. New insight into carbonate platform evolution has been gained from outcrops by describing subseismic geometric and facies relationships within a larger seismic-scale chronostratigraphic framework. Integration of the outcrop and seismic and knowledge of the subseismic facies distributions has improved seismic stratigraphic prediction. Recently, seismic analysis of carbonate strata has focused on the generation of more accurate and robust stratigraphic frameworks and large-scale carbonate platform architecture. Delineating the depositional sequence framework provides a predictive way to map reservoir (e.g., grainstone shoals, reefal rudstones and floatstones, etc.), source, and seal lithofacies, and to qualitatively delineate

Processing SIG continued on page 9

SPECIAL INTEREST GROUPS

Potential Fields continued from page 6

ABSTRACTS:

Understanding Gravity Gradients

Afif H. Saad, Saad GeoConsulting

To understand Gravity Gradients, one starts with the basics, the Gravitational Potential, computes and examines the following :

1. the first derivatives of the potential , i.e. the gravity field components, followed by :
2. the second derivatives of the potential (derivatives of each gravity component), to arrive at the Gravity Gradient components of the full tensor.

The model used for this purpose, constructed with GOCAD, is a diapiric salt body placed within a sedimentary section whose density increases with depth. The upper part of the salt is above the "Nil" zone, thus having positive density contrasts with the surrounding sediments, while the lower part of the salt body has negative density contrasts.

Contour maps of the various components computed above are displayed in color with the model projected for reference. In addition, various combinations of the gravity gradient components are also shown and used for enhancements to aid in the interpretation of the data. These include Amplitudes of the Horizontal Gradient, Total Gradient (or Analytic Signal), and Differential Curvature (also known as Horizontal Directive Tendency or HDT). Other Invariants can be computed and used as well for interpreting the data.

Biography

Afif H. Saad is a Geophysical Consultant, specializing in integrated gravity / magnetic / seismic / geologic interpretation, modeling, magnetic depth estimation, and training. He has over 25 years of experience in the oil industry, including GULF, CHEVRON and UNOCAL. He also held positions with Aero Service Corp. in Philadelphia and LCT Inc in Houston as well as in the academia. Afif received a Ph.D. in Geophysics from Stanford University. He is a member of SEG, Gravity and Magnetics Committee, and GSH. He is the chairman of the Houston Potential Fields SIG of GSH, and currently serving a fifth term as an Associate Editor for GEOPHYSICS.

Potential Fields continued on page 8

Rock Physics SIG

Abstract:

In 1982, SEG's Delphi Survey forecasted that seismic would solve the problem of drilling partially saturated reservoirs (fizz) by 1995. Unfortunately, this has not occurred. Our limited success is often attributed to the application of only two terms in AVO inversion. However, a gas reservoir can have the same AVO curve as a higher-porosity fizz reservoir. Thus, AVO inversion, even with robust three-term solutions, will not distinguish gas reservoirs from fizz without additional information about the rock properties.

For insight about the effect of saturation on AVO, Wang's three-term equation is examined. Wang defines three reflectivities that are associated with velocity, density and rigidity changes. As expected, the rigidity term is rather insensitive to fluid properties while the ratio of the density reflectivity to the velocity reflectivity is indicative of fluid saturation for a common reservoir.

Next, Wang's reflectivities were related to a rock-property database constructed from the deep-water Gulf of Mexico. Sand and shale properties exhibit a strong statistical correlation when they are referenced to

individual reservoirs rather than depth. In fact, the reflection coefficient for gas and oil reservoirs can be accurately estimated from the wet-reservoir NI. In addition, the AVO velocity, density and rigidity reflectivities were linearly fitted to the zero-offset amplitude. In short, with an estimate of NI for a wet reservoir, the NI for gas and fizz are predicted and then the shape of the AVO curve for any saturant is predicted. While this procedure doesn't uniquely distinguish fizz from gas saturation, it does offer a method to quantify rock-property assumptions and thus quantify risk.

Biography:

Fred J. Hilterman received a geophysical engineering degree and PhD in geophysics from Colorado School of Mines. He worked with Mobil from 1963-1973. In 1973, he joined the University of Houston where he was a Professor of Geophysics. At UH, Fred co-founded the Seismic Acoustics Laboratory (SAL). In 1981, he co-founded GDC, now a subsidiary of Geokinetics. Fred also lectures at UH where he is a Distinguished Research Professor.

Date: Wednesday,
September 24, 2003

Time: 5:30 p.m.

Location: Visualization Center
Veritas DGC, Inc.
10300 Town Park Dr.
Houston, TX 77072

Reservations: GSH (713) 463-9477
Email: joan@hgs.org

Contact: Keith Katahara
(keith@spinexp.com)
Tad Smith
(tad_smith@veritasdgc.com)

Title: Predicting Fizz Saturation
with AVO

Speaker: Fred Hilterman
Geophysical Development
Corporation