



Geophysical Society of Houston

VOL. 34, NO. 2

NEWSLETTER

OCTOBER 1999

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Technical Luncheon

Date: Tuesday,
October 19, 1999

Time: Register and Cash Bar
11:30 am
Luncheon and talk
12:00 pm

Location: H.E.S.S. Building
5430 Westheimer
North side of
Westheimer between
Chimney Rock and
Yorktown

Title of Talk:

3-D AVO for Exploration and Field Development

Speaker:

Chuck Skidmore,
Diamond Geoscience Research
Corp., Tulsa, OK

Authors: Chuck Skidmore, Richard Lindsay and Davis Ratcliff, Diamond Geoscience Research Corp.

Abstract:

3-D AVO analysis is a fundamental geophysical tool that is significantly underutilized in today's energy industry. Information extracted from regional 3-D AVO projects allows the geoscientist to better understand and evaluate the geologic and economic risks associated with exploration and field development. Critical geologic data such as thickness changes within the reservoir, relative hydrocarbon saturations within the reservoir, bed geometry and cap rock changes can all be analyzed through the application of 3-D AVO technology. We will show that through the use of several geophysical tools such as 3-D AVO, 3-D net sand prediction, 3-D pressure

prediction and rock property modeling, the exploration team and/or the field development team can dramatically improve upon their exploration strategy, field development strategy and their overall risk assessment strategy for finding economic quantities of hydrocarbons in the Gulf of Mexico.

In the technical presentation we will show several examples of how 3-D AVO results have consistently agreed with well data. We will also discuss the complexity of the AVO signatures within the Gulf of Mexico and show how these complexities are linked to geologic changes within the reservoir. Our 3-D AVO examples are taken from water depths of 200' - 7000' and reservoir targets ranging from 5000' - 18,000'. We will end the presentation with a discussion of how 3-D AVO integrated with other geophysical techniques can be an excellent tool for 3-D reservoir characterization and show how these techniques benefit exploration and development on a worldwide basis.

Biography of Chuck Skidmore:

Chuck Skidmore is Vice President of Geoscience Applications for Diamond Geoscience Research Corporation. He previously worked with Amoco Corporation in the worldwide application of AVO and other tools for prediction of lithology and fluid content. In the past 10 years he has worked in all phases of lithology prediction, including seismic processing, application, and research. He holds an MS in Geology from the University of New Orleans and a BA in Geology from State University of New York at Buffalo.

REMINDER

If you have a blue address label on your newsletter, you are delinquent in paying your dues and will be dropped from membership. Call the GSH office at 713/785-6403 to pay via credit card.

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Editor's Note

To insure your information reaches the GSH society members in a timely manner it must appear in the 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 may be sent to wendyj@diamondg.com or faxed to 713/783-9780.

1999 GSH Newsletter Deadlines

Issue November, 1999
Deadline Oct. 13, 1999

Issue December, 1999
Deadline Nov. 13, 1999

Issue January, 2000
Deadline Dec. 13, 1999

Geophysical Society of Houston

New Members as of September 9, 1999

Active:

Thomas Barton
Albert Brown
John Dombrowski
Ian Jack
Keith Potter
Charles Smith
Frederick Wall
James Webb
Linda Zimmerman

Associate:

Michael Bertness
Carmen Comis
Michael Kowalski

Technical Breakfast

Date: Wednesday,
October 13, 1999
Time: 7:00am
Place: Shoney's Inn -
Presidential Room
12323 Katy Freeway
(set back from south
side Katy Frwy access
road, just east of Dairy
Ashford)
Directions: The hotel it is set well
back from the frontage
road, so can be easily
overlooked. The
entrance road to the
hotel is a right turn off
of the southside
frontage road and is
just east of the
entrance to a new
restaurant, Texas Land
& Cattle

Title of Talk:

Current Status of Marine
4-Component Seismic Technology

Speaker:

Jack Caldwell, Schlumberger

Abstract:

Marine multicomponent seismology has seized the geophysical industry's fancy since it made its semi-commercial emergence in the North Sea in the autumn of 1996. This technology involves the recording of S-waves, in addition to the conventional P-waves, by deploying sensor packages containing hydrophones plus 3-component geophones on the seafloor. New processing algorithms have been developed to properly process these data. The major uses of this type of data have been (1) to image beneath gas clouds and chimneys, (2) to better infer lithologic and pore fluid information some distance away from wells, and (3) to image beneath high velocity bodies such as salt and basalt masses. The future looks bright for this technology, for reservoir characterization, for seismic time-lapse monitoring (4D), for reservoir

management, and perhaps even for exploration.

On the order of 100 4-component marine surveys have been acquired since September, 1996, the vast majority of them being 2D. However, the first handful of 3D 4C surveys have had the processing phase completed, and the information content of these data sets has been very high, and very useful. These surveys have been conducted in the North Sea, the Far East, offshore West Africa, and in the Gulf of Mexico. The overall experience is that the data quality in all locations is relatively high, the systems couple reasonably well to the seafloor, and the bulk of the mode-converted S-wave energy derives from P-waves mode-converting to S at depth, and not at the seafloor.

Four fundamentally different acquisition systems are used in the industry today to acquire the P- and S-wave data: three different cable-based systems, as well as one node-type system. There are at least three different modes of deployment of the cable systems: dragging the cable into place, draping it under tension, and draping it without tension. The node-type system is emplaced by a remotely operated vehicle (ROV). While data quality certainly is not uniform across the industry at the present time, it is not clear yet how system construction and deployment directly affect the data quality. More analysis and research is needed in this area, and is no doubt forthcoming.

There are issues still to be resolved with regard to data processing of marine 4C data, but headway is rapidly being made. Advancements in handling the vector nature of the data, anisotropy, wide azimuth acquisition, and PS depth imaging are needed, and are occurring at the present time.

The cost to acquire 3D marine multicomponent data is 1.5 to 4 times more expensive than conventional towed streamer 3D, but that is expected at this stage of the development of the technology. The

Technical Breakfast continued on page 4

From the Previous Editors Desk: Viewpoint

So these two geophysicists are sitting in a bar, discussing whether seismic interpretation is an art or a science. She is a former interpreter for a large independent who has moved into consulting, and he processes data for a major oil company.

He says, "It must be a science. If you select your processing parameters carefully enough, virtually anyone can find the prospect, and usually does."

She maintains, "It is an art, because you can take the same data to several potential partners and each of them will map it differently. Remember - 'oil is found first in the minds of men', and that will always be true."

Now this is a particularly well stocked bar and has a copy of Webster's dictionary right next to the Jagermeister, so they call Frank the bartender (bartenders are always named Frank) over with the book and look it up right there. Art is "a human skill, as opposed to nature" or "a system of rules; a profession or craft" while science is "systematic knowledge of natural or physical phenomena."

They both go back to their drinks, having only confused the issue for the moment.

Finally, she says "OK, it has to be an art because you build up all these systematic rules, like flat-lying isotropic layers, and then you stick a salt dome in the middle of your survey, which violates all your assumptions, so it takes human skill to sort all that out."

"But", he replies, "you are taking knowledge of well-defined physical

properties, like velocity and attenuation, and you are applying them to the physical phenomena found in the earth. Just because the earth doesn't behave like you want it to doesn't mean it's not science."

She orders another glass of Merlot and is silent for a while. Then, cocking one eyebrow over the rim of her glass, she skewers him with "What are you doing when you define a prospect? You are creating something with your own personal experiences and attitudes imbedded into it - that's art!"

"Creativity isn't mutually exclusive with science, you know", he replies. "David Mermin, a Cornell physicist, described it as 'a process that always manages to get you somewhere, provided only you don't specify in advance the particular nature of the ... things to develop'. Now that really describes how creative scientists have to be!"

Just then the jukebox begins playing "Born in the USA" and our consultant perks up. "Hey, I heard Bruce Springsteen say the other night on Charlie Rose that 'most art is just a series of dysfunctions that someone manages to put together in a creative way'. You ever notice how the most successful geophysicists are usually the ones with some eccentricities or bizarre personalities? Hell, they're artists!"

The processor has now become sullen, thinking he's lost the argument and probably a chance at a date, but he's willing to try one last time. "Science depends more on passing on

knowledge and experience. The biggest problem our industry has right now is the loss of people with insight that new employees can build on. An artist could start from scratch and create something new, but we need to learn from past experiments and failures. That David Mermin again: 'in (geo) physics, we don't even know the complete rules of the game, and probably never will. And the rules that we do know are so strange that were we to merely write them down ... in a generation or two nobody will be able to make any sense of it.' So the very fact that we're in the bind we are right now makes us scientists. It's the science we need to convince oil companies it's worthwhile to preserve and nurture." He smirks and lights up a cigar.

But as usual, the woman has the last word. "But it's the companies that keep the creative users of the science that will maintain a competitive advantage, the ones that find new ways to interpret, meld, and cross-pollinate all the new techniques and ideas coming into use. It's the artists that will save the oil industry!"

And as she walks off to the far end of the bar, her hips seductively swaying in the smoky half-light, he thinks, "Damn, we're both right. I should have just agreed with her."

Jess Kozman

Technical Breakfast continued from page 3

cost will decrease fairly dramatically in the future as capacity and production rates increase.

About JACK CALDWELL

Jack received a bachelor's degree in mathematics from Davidson College (1971), and a Ph.D. in geophysics (earthquake seismology and tectonophysics) from Cornell University (1978). He immediately entered the oil industry as a Research

Geophysicist at Texaco's research lab in Houston where he worked on the overall problem of extracting lithologic information from seismic data. From 1980 until 1987, Jack held various positions in various locations in research and exploration at Marathon Oil Company. He joined Schlumberger Wireline in 1987, and moved over to sister company Geco-Prakla in 1992, and currently is Manager, Reservoir Solutions, North and South America,

a position he has held since January, 1998. The common thread which runs through most of his assignments is that he has been involved in developing, introducing, or marketing new technologies oriented toward extracting lithologic information from seismic data. Time lapse seismic (4D) and marine multicomponent seismology (marine 4C) are two areas occupying most of his time at present.

GSH Reservoir Geophysics

SIG Seminar in October 1999

Date: Wednesday Oct. 20, 1999,
Time: 4:30 - 6:30 pm
Social 4:30 - 5:00 pm
Presentation One 5:00 - 5:45 pm
Presentation Two 5:45 - 6:30 pm

Location: Terrace Room
BP-Amoco
501 Westlake Park
Boulevard
Houston, Texas

Speakers: Greg Partyka,
BP-Amoco
Yafei Wu,
HARC-GTRI

Cost: NONE.

Theme:

Seismic spectral decomposition for stratigraphic and lithologic interpretation

Organizer:

Quincy Chen, Ph.D.
GSH Reservoir Geophysics SIG
Chairman, qcc@factcorp.com,
(281)265-2512, 265-7626

Speaker 1:

Gred Partyka BP-Amoco

Co-authors:

James Gridley and John Lopez

Speaker biography:

Greg Partyka is currently a project geophysicist for BP-Amoco's Western U.S. Gas. Since 1988, he has worked for Amoco in Calgary, Poland, Houston, and Tulsa; primarily focussing on interpretive seismic processing techniques. The BP-Amoco merger has brought him back to Houston. He received a bachelor's degree (1987) in geological

engineering from the University of Manitoba.

Presentation title:

Interpretational Applications of Spectral Decomposition

Presentation abstract:

Spectral decomposition provides a novel means of utilizing seismic data and the discrete Fourier transform (DFT) for imaging and mapping temporal bed thickness and geological discontinuities over large 3D seismic surveys. By transforming the seismic data into the frequency domain via the DFT, the amplitude spectra delineate temporal bed thickness variability while the phase spectra indicate lateral geologic discontinuities. This signal analysis technology has been used successfully in 3-D seismic surveys to delineate stratigraphic settings such as channel sands and structural settings involving complex fault systems. The methodology, along with examples from real and model data, will be shown during the presentation.

Speaker 2:

Yafei Wu Ph.D. HARC-GTRI

Presentation title:

Time-frequency decomposition of seismic data based on Wavelet Transform

Speaker biography:

Dr. Yafei Wu is currently working in the Geotechnology Research Institute (GTRI) at Houston Advanced Research Center (HARC). His research interests are in the 3-D AVO and seismic attributes analysis.

The current research topics include 3-D true-amplitude migration, 3-D survey footprint corrections, and wavelet transform based time-frequency analysis and applications for seismic data. He graduated from the University of Texas at Dallas in Geophysics.

Presentation abstract:

In seismic data, the frequency contents change with recording time or change with depth that seismic waves travel through. Two factors contribute to the frequency content

changes, the intrinsic attenuation and scattering (such as thin bed effect). The frequency content changes represent stratigraphy and rock physics changes. Efficient and accurate identifications of these changes in seismic data will provide new seismic attributes for seismic stratigraphy and reservoir characterization. However, for most seismic data processing, the information contents contained in seismic frequency changes are suppressed or ignored.

Instantaneous frequency and Short Time Fourier transform are the traditional tool for time-frequency (TF) decomposition of seismic data. The instantaneous frequency is in fact an average evaluation of frequency contents. It smears detailed changes of frequency spectrum and phases. The short Time Fourier transform (STFT) is the well known time-frequency tool. It does provide an instantaneous frequency spectrum and phases. However, the fixed window length in the STFT introduces artifacts to the results, which is known as the window effects. We propose to develop a new time-frequency decomposition tool based on the wavelet transform that will provide higher time-frequency resolutions without window effects. We will use this new tool to develop time-frequency seismic attributes associated with attenuation, dispersion, and seismic reflection patterns. These attributes can be used for seismic stratigraphy and reservoir characterizations. Further more, the new tool developed will provide a new way to study seismic data.

Acknowledgments:

GSH appreciates BP-Amoco for providing the facility for the GSH seminar.

POTENTIAL FIELDS SIG

A THREE-DIMENSIONAL GEOLOGICALLY CONSTRAINED DENSITY INVERSION OF GRAVITY POTENTIAL

BY
KEVIN CRAIN

Where: HESS building, 5430
Westheimer, Houston

WHEN: November 18, 1999
5:30 Social Hour;
6:30 Dinner;
7:30 Presentation

Cost: \$22.00

Contact: Mike Kowalski, Chair - GSH
Potential Fields Group, at 713-432-
6828 (kowalma@texaco.com) by
Tuesday, NOVEMBER 16, for
reservations. E-mail is best because I
can confirm your reservation. Please
HONOR your reservation! We must
bill no-shows!

Abstract:

I am developing a gravity potential

interpretation using 3-D geologic models in areas of complex geology and topography. To illustrate this interpretation I will show results for both regional and detailed geologic interpretations using gravity potential data in and around Jackass Flats at the Nevada Test Site. The gravity contribution at unit density of each 3-D geologic body is computed from the surface integral computed on a regularly gridded representation of the surface. I then test the geologic model's consistency using a least squares inversion algorithm on density, constrained by the body's expected densities and gravity contributions. Consistency is deemed an adequate fit, and inconsistency requires modification of the geologic structure or a re-evaluation of the expected rock densities. The initial regional geologic model around NTS had a residual field of about 40 mgals and application of the inversion left a zero-mean residual of about 15 mgals in the area of interest. This residual field clearly reflects geology not modeled at the regional scale. This regional modeling is a clear improvement over the complete Bouguer anomaly in this area.

Venezuelan Geological Society to Host Symposium

The Venezuelan Geological Society will host "VII Simposio Bolivariano-Petroleum Exploration in the Sub Andean Basins" September 10-13, 2000, in Caracas, Venezuela. Abstracts are now being requested, with a deadline of January, 30, 2000. Suggested topics are: "New Concepts in Basin Modeling",

"New Approaches for Gas Exploration", "Prediction of Trends in Rock Quality", "Reservoir Characterization", and "Impact on Hydrocarbon Exploration and Development of Emergent Technologies". There will also be a pre-symposium field trip and three short courses.

For more information contact: Victor Vega, International Coordinator, at 281-560-8772(phone), 281-560-4484(fax), or vegavh@bp.com, or contact the Venezuelan Geological Society at svg@mailserver.reacciun.ve in Caracas, Venezuela.

NEW DIRECTOR OF THE ALLIED GEOPHYSICAL LABORATORY, UNIVERSITY OF HOUSTON

Dr. Kurt Marfurt will join the Department of Geosciences at University of Houston as Director of the Allied Geophysical Lab and Full Professor of Geophysics. Dr. Marfurt brings a wealth of research and practical experience in applied reflection seismology to the Allied Geophysical Lab.

Dr. Marfurt served as a senior Geophysicist at Amoco's Research Lab in Tulsa prior to accepting the position at the University. He received his Ms.

and Ph.D. in Applied Geophysics from Columbia University. After receiving his degree in 1978, he became an assistant professor at the Henry Krumb School of Mines at Columbia University and then joined Amoco as a senior research scientist in 1981. He spent 18 years with Amoco conducting and leading research efforts in seismic processing, imaging, tomography, attribute analysis, and inversion. He was the team leader of Amoco's seismic coherency effort, which represents a significant and widely used exploration technology developed by the Amoco Research Lab. Most recently, Dr. Marfurt focus has been on 3-D multicomponent constrained inversion to estimate lithology and fluid product. He has also participated in efforts to couple seismic attributes and impedance estimates to reservoir simulators. While at Amoco, Dr. Marfurt served as Technical Program

Coordinator for Multicomponent Seismic Analysis, as Geophysical Discipline Coach, as Team Leader for Seismic Coherency and Spectral Decomposition R&D, as Special Research Associate for Signal Analysis and Migration/Inversion, as a Petroleum Geophysicist (in Central/Southern Europe, Latin America, Far East), and as Research Supervisor for Basin Analysis, Seismic Stratigraphy and Supercomputer Implementation efforts.

Dr. Marfurt joins other faculty members, Dr. Robert Sheriff, Dr. Fred Hilterman, and Dr. Hua-wei Zhou, at the the Allied Geophysical Lab and he will help to continue a tradition of serving research and training needs in applied reflection seismology as the new Director of the Allied Geophysical Laboratory.

Buying and Selling Production

**Thursday, October 14
8:30 a.m. - 4:00 p.m.
Shell Auditorium, One Shell Plaza**

Buying and selling production requires different focus and skills than exploration and development activities. Both novice and experienced production traders will learn from this course, featuring the following presentations:

Merger, Acquisition, and Divestment Transactions

Overview

David L. Bole, VP Corporate Research & Development, Randall & Dewey, Inc.

Exploring Vs. Buying Reserves

Dan Olds, Petroleum Engineering Consultant, Coopers & Lybrand

Structuring the Deal: Who Does What, When

Geoff Roberts, Madison Energy Aide; Georgia Conger, handles slides & presentations

Financing the Deal

Paul Riddle VP Finance, First Union

Auctions vs. Negotiated Sales

Ken Olive, President, The Oil & Gas Asset Clearinghouse

Luncheon Keynote speaker:

John Walker, President & CEO of Enervest Management Company

This course is intended for any upstream energy professional geoscientist, petroleum engineer, petrophysicist, or landman.

Cost: \$75

Course is limited to first 50 registrants.

Lunch is included.

To reserve a seat, send a check payable to HGS to:

**HGS, 7457 Harwin, Suite 301,
Houston, Texas 77036,
Attn: Networking Course**

GEOPHYSICAL AUXILIARY OF HOUSTON

The Auxiliary will be in good hands under the leadership of the following officers for 1999-2000.

President, **Linnie Edwards** • First Vice-President, **Jane Hasenpflug**
Second Vice-President, **Georgeann Massell** • Secretary, **Marinell Williams**
Treasurer, **Mary Blanchard**

Committee chairpersons include Linda Roberson, Kitty Scharlach, Barbara Alexander, Joyce Kubik, Bob Ann Rossi, Ruthene McDaniel, Kathy Hilterman, Lois Matuszak, Claire Dauphin, Carol Gafford, and Anna Kendall. Contact any of the above officers for information on joining our group. We look forward to seeing you at our meetings.

SCHEDULE OF EVENTS:

FALL BRIDGE LUNCHEON: H.E.S.S. Building on October 18, 1999. Reservation deadline is October 11. Members and Guests: \$13.00. Contact Claire Dauphin at 281-491-8249 for information.

DUPLICATE BRIDGE: 2nd Friday of each month at 7:00 p.m. Contact Margaret Webb at 713-723-0645.

FALL SPECIAL EVENT: The SEG Annual Meeting. We need volunteers to assist with decorating for the luncheon and to help stuff bags. Contact Donna Parrish at 281-859-8088 to volunteer your help.

WINTER LUNCHEON: The Briar Club on Wednesday, January 19, 2000

SPRING BRUNCH: Lakeside Country Club on Sunday, March 12, 2000

SPRING SPECIAL EVENT: Round Top Herb Garden on Tuesday, April 11, 2000

ANNUAL BUSINESS MEETING AND LUNCHEON: Racquet Club on Thursday, May 18, 2000

Remember that yearly dues are only \$15.00 for the spouse of any member in good standing of the GSH and the widows of deceased members. Call Georgeann Massell at 281-353-7894 or Carol Gafford at 281-370-3264 for more information.

Carol Gafford — GSH Liaison

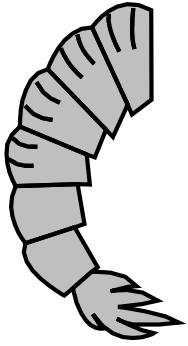
IAGC to sponsor conference focusing on non-exclusive, (spec) geophysical data

It's a given that 3-D seismic revolutionized the oil and gas industry. Yet, were it not for the widespread availability of relatively inexpensive non-exclusive (spec) data, the vastly improved drilling success rates of the past several years would be enjoyed only by those companies who could afford pricey proprietary data.

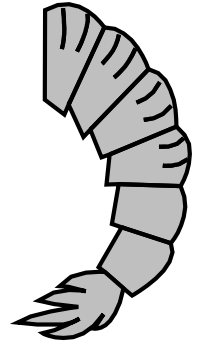
With the recent industry-wide spate of cost-cutting, downsizing, mergers, etc., many of the old rules are being rewritten or severely tested, and spec data, which provide the foundation for the bulk of U.S. exploration activity, are being impacted along with all other areas of the industry.

Even in the best of times, however, the myriad business issues associated with spec data - legal, financial, ethical and others - are often misunderstood/unappreciated by those industry participants who need and use these data.

These issues will be addressed at the upcoming conference, "Current Issues In Non-Exclusive Geophysical Data....The Exploration Tool of Choice". Sponsored by the IAGC, the event will be held November 16-17 in Houston at the DoubleTree Hotel at Post Oak. For registration information, contact Louise Durham, conference co-chairman, at 713-840.1510.



HGS/GSH



Shrimp Peel

Saturday, October 30, 1999

5:00 p.m. until 10:00 p.m.



SAM HOUSTON RACE PARK

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(Beltway 8 between Hwy 290 & I-45 N)

TICKETS \$20.00 Advance / \$30.00 At The Door

- Advance ticket sales through October 20th
- Tickets will be mailed to you
- No refunds

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PHONE _____ E-MAIL _____

NUMBER OF TICKETS _____

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Attn: Lee Shelton
2500 Tanglewilde, Suite 120 • Houston, Texas 77063

For more information call 713/789-2444 or e-mail: LShelton@scacompanies.com

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The Geophysical Society of Houston (GSH) recently elected new officers to its executive board for the 1999-2000 term. They are (left to right) Wendy Jones - Editor- Lloyd R. Weathers - First Vice-president- Philip L. Inderwiesen Treasurer- Patrick J. Starich - President- John R. Sumner - President-elect; and Kathryn Hardy -Secretary. GSH was formed in 1947 to promote the science and profession of geophysics and currently has over 1800 members. GSH holds a technical luncheon at 11:30 a.m. on the third Tuesday of the month at the Houston Engineering and Scientific Society and conducts an extensive program of technical symposia and seminars open to the public. Visit the GSH website at www.seg.org/sections/gsh/gshhome.html or call the office at 713-785-6403 for information on meetings and membership.



1999 GSH TENNIS TOURNAMENT

FRIDAY, OCTOBER 8, 1999 at 12:00 noon

Chancellors Tennis Club

\$30.00 per person

Play will began promptly at 1:00pm and conclude by 5:00pm. Lunch will began serving at 11:30am. 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 October 4, 1999. We need more players and encourage you to contact your associates to participate in the tournament. We are again inviting players in the Geological Society to join with us so as to have more players and more fun. For information call Bill Steiner 713/789-72550 or Joe Jones 281/438-5626.

1999 GSH TENNIS TOURNAMENT ENTRY FORM

NAME _____

Phone No. _____ Company _____

Flight Preferred: A _____ B _____ Ladies _____

Make check payable to: GSH Tennis Tournament
MAIL TO: Joe Jones • 3802 Pecan Valley Drive • Missouri City, Texas 77459

Selling Prospects? Buying or Shooting Seismic? Learn "How to" protect yourself from potential Legal pitfalls

Tax, Trade and Legal Considerations
Thursday, October 14 • 8:00 a.m. to 4:30 p.m.
One Shell Plaza Auditorium

It has taken you five years to put this prospect together. You've assembled your lease block and need partners to develop the play. What are the tax considerations when structuring the deal? What contracts should you use for protecting yourself? What legal documents should you expect when the purchaser of your prospect "puts the paper together"? Taking the basic prospect through data acquisition, drilling, changes in prospect configuration and development, you will learn

- considerations and their tax consequences
- legal agreements to use
- when and what documents insure that you and you partners are protected from potential legal problems
- systematic approach to applying tax and legal matters, presented by experts in those areas
- opportunity to identify and confront hurdles present in your own prospect, in practical sessions

Distinguished speakers include:

Scott Laurent; President, Laurent Oil and Gas
Neil Blakely; Blakely and Bandy, C.P.A.'s
James Pearson; Pearson & Pearson, A Professional Corporation
Ronald L. Moore; President, Ronald L. Moore, P.C., a Professional Corporation

This course is intended for any upstream energy professional geoscientist, petroleum engineer, petrophysicist, or landman.

Cost: \$35.00, Includes lunch

To reserve a seat, send a check payable to HGS to:
HGS, 7457 Harwin, Suite 301, Houston, Texas 77036
Attn: Tax, Trade, Legal Course

GeoEvents Calendar

Make reservations by e-mail at reservations@hgs.org and include your member number (found on Bulletin mailing label), or use the phone reservation system at 713/917-0218.

Reservation Codes

Use these codes to make voice mail meeting reservations:

Dinner Meeting	5-0-1
Environmental & Engineering Geologists	5-0-2
International Explorationists	5-0-3
North American Explorationists	5-0-4
Luncheon Meeting	5-0-5
Emerging Technology	5-0-6
Breakfast Meeting	6-0-7

Dinner Prices

General Dinner Meeting	\$20
Environmental & Engineering	\$16
International Explorationists	\$21
Luncheon Meeting	\$20
North American Explorationists	\$20
Emerging Technology	\$20
Guests and Walk-ups	\$25
No-shows are billed	

"2nd Annual Seismic Softball Tournament"

**benefiting the SEG Foundation to be played here in
Houston on October 16, 1999.**

The tournament will be held at the **Sportspark located at 10810 Barley Lane**. The Geophysical Society of Houston will be there as well. Times to be announced as details unfold. If you wish to donate to the SEG Foundation, please contact one of the people below.

Michelle Kluge, Planning details,
Competitor Sponsorship PGS Data Processing
713-706-0516 (direct line) • michelle.kluge@pgs.com

Marisa Rowland, Planning details, Vendor Sponsorship,
and Co-ed Team leader PGS Shared Services
713-819-8342 (cell) • 713-781-4000 (x1392)
marisa.rowland@pgs.com



Stroll the Halls Houston Museum of Natural Science

Wednesday, November 3, 1999
7 p.m. to 11 p.m.

Come relive your early science years with us as we "Stroll the Halls" at Houston's world-renowned Museum of Natural Science. This year's Wednesday Night Gala offers you the chance to see incredible exhibits in the Weiss Energy Hall, the Paleontology Hall, the Cullen Hall of Gems and Minerals, the Strake Hall of Malacology, the Welch Chemistry Hall, the Farish Hall of Texas Wildlife, the Hall of the Americas.....and many more.

Weiss Energy Hall

Video holography, virtual reality and interactive touch-screen computer stations help make this one of the most advanced exhibit halls of its kind in the world. Take a simulated ride thousands of feet down an oil well borehole; shoot off a seismic air gun; trace petroleum products through a transparent refinery; sort giant natural gas molecules using a form of virtual reality; compare the energy of oil and natural gas to other energy sources. You'll never view energy quite the same after you visit this hall and learn about oil and natural gas formation, how we search for it, recover it, refine it and transport it.

Paleontology Hall

Over 450 specimens are on permanent display in this recently constructed hall. The majority of the items on display are actual fossils, such as the Edmontosaurus skeletons which are approximately 90% fossilized bone. Others, such as the Tyrannosaurus rex, are casts made from fossils on display elsewhere. Fiberglass and foam models show what some of the strange creatures of Earth's past must have looked like when alive. Newly recovered specimens continue to be added to the hall.

Cullen Hall of Gems and Minerals

This recently renovated hall features over 600 spectacular mineral specimens. The exhibit is unquestionably the world's finest display quality collection of natural mineral specimens. Elegant wood display cases accent a treasure of world-class mineral specimens-many of which are the finest examples ever recovered.

Strake Hall of Malacology

Approximately 2,500 shells are on display in this area. The shells, from land, sea and fresh water animals, are collected from all over the world. Continuous videos in the hall show some of the live animals that created the shells. The Museum's mollusk holdings are the largest in the Southwest and play a significant role in the scientific world.

Welch Chemistry Hall

Our Periodic Table of Elements will stop you in your tracks! The 104 elements are drastically presented in a 10-foot by 20-foot lighted case with the actual elements and examples of their uses wherever possible. Are your dinner plates radioactive? Put a Geiger Counter near some safe radioactive samples for a demonstration. Touch a super-hot Space Shuttle tile without getting burned. Step onto a special scale to see how much hydrogen, helium, oxygen and other elements make up your body. Try your hand at mixing oil and water or take on the challenge of a computer chemistry game. Over 35 displays in this permanent hall demonstrate the fascination world of chemistry.

Farish Hall Texas Wildlife

The dioramas found in this hall introduce you to some of the wildlife currently found in Texas, as well as some of the species that have vanished since man began setting the land. Attwater's prairie chicken, which is losing the battle for coastal prairies to grazing livestock and croplands, is now found only on the Gulf Coast of Texas. The peregrine falcon makes his nest among steep, rocky cliffs to safeguard its eggs from other predators. A re-creation of a peregrine's nest (called an eyrie) and eggs, is one of the highlights of the reinstallation. The collared peccary (javelina) is the only pig-like mammal native to North America.

John P. McGovern Hall of the Americas

Thousands of years of Native American history spread across a geographic region from Alaska to Peru is on display in nine spectacular galleries. This gallery features information of origins of ancient peoples of the Americas including a re-creation of a Texas archaeological site that contained over 10,000 years of human history.

Meet your friends here for a wonderful adventure while enjoying a variety of musical flavors throughout the Museum provided by Mango Punch South American salsa rock and Yvonne Washington (old-time New Orleans jazz and much more).

The Museum will be open from 7 p.m. to 11 p.m. for an open-house strolling type of experience. SEG bus transportation will be provided on a regular basis to and from all convention hotels and the Houston Museum of Natural Science. Free parking in the Museum garage will also be available for those who want to drive themselves. The event will be catered to provide light evening appetizers with a cash bar.

OCTOBER 1999

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
					1	2
3 SPE Annual Technical Conference & Exhibition	4 SPE Annual Technical Conference & Exhibition	5 SPE Annual Technical Conference & Exhibition	6 SPE Annual Technical Conference & Exhibition	7	8 GSH Tennis Tournament Auxiliary Duplicate Bridge	9
10	11	12	13 GSH Technical Breakfast NEWSLETTER DEADLINE	14 HGS Continuing Education	15	16 2nd Annual Seismic Softball Tournament
17	18 Auxiliary Bridge Luncheon	19 GSH Technical Luncheon	20 Reservoir Geophysics SIG Data Processing SIG	21	22	23
24 <hr/> 31 SEG International Exposition and Meeting	25	26	27	28	29	30 GSH/HGS Shrimp Peel

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