



Geophysical Society of Houston

VOL. 33, NO. 9

NEWSLETTER

MAY 1999

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Technical Breakfast

Applying Relative Entropy Spectrum Deconvolution

Date: Thursday
May 13, 1999

Time: 7:00 a.m. breakfast,
7:45 a.m. presentation,
8:15 to 8:30 a.m. Q&A

Place: CGG, Park Row,
Houston, Texas.

Cost: No cost

Reservations: by noon Monday,
April 5. Code 607

John F. Parrish Shell E&P Technology Company

A theoretical exposition of minimum relative entropy spectrum deconvolution (REDCON) was presented in November 1997 at the 67th Annual International Meeting of the Society of Exploration Geophysicists. The REDCON filter is derived from both a current observation of the autocorrelation function of the seismic record and an expected output spectrum for the same time-space gate. This unique filter converts the observed seismic spectrum into a practical approximation of the expected, but only if appropriate noise (energy or entropy) constraints are imposed.

Examples will be shown of some typical (marine) observed spectra. Wiener (whitening) deconvolution of these spectra can distort the output seismic phase in order to adapt to very low and very high frequency noises or to non-minimum phase characteristics of the acquisition system. Practical rules-of-thumb for choosing relative entropy deconvolution constraints will be discussed. The resulting REDCON filters are generally more robust than

the corresponding Wiener filters and the output seismic phase errors are smaller.

Speaker biography:

John F. Parrish received a B.S. degree in physics (1964) from Loyola University of Los Angeles, then M.S. and Ph.D. degrees in physics (1966 & 1969) from Massachusetts Institute of Technology. After working for Hughes Aircraft Company, Ground Systems Group, as a radar engineer and for NASA, ERC, as an infrared spectroscopist, he joined Shell Development Company as a geophysicist in 1969. He has worked on diverse projects within Shell Oil Company, serving as party-chief, inventor, future-ologist, supervisor of geophysical programming, and flying doctor. His current interests include 3D deconvolution, quantitative signal processing for seismic imaging, and interference and noise suppression.

Upcoming GeoEvents

June 7

**North American
Explorationists Group
Clastic Depositional Systems
Symposium**
look for more details in next
month's Bulletin

June 11

HGS Guest Night
Crowne Plaza Hotel

June 21

**International Explorationists
Dinner Meeting**

July 10

HGS Skeet Shoot

**"What to do with the Rest of
Your Life" May 22-23.**

GEOPHYSICAL SOCIETY OF HOUSTON

Joan Henshaw, Office Manager • 7457 Harwin Drive, Suite 301 • Houston, Texas 77036 • Office Hours 8 a.m. - 5 p.m.

Phone: (713) 785-6403 • Fax: (713) 785-0553 • Event Reservations Number: (713) 917-0218

email: reservations@hgs.org • website - <http://www.seg.org/sections/gsh/gshhome.html>

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SOCIETY OF INDEPENDENT PROFESSIONAL EARTH SCIENTISTS
Presents
A CONTINUING EDUCATION SEMINAR

**“You’re On Your Own, Kid” or
“Becoming a Successful Entrepreneur” (Helping the Self-Employed to Survive)**

Date: Tuesday,
May 18, 1999

Time: 8:00 a.m. to 5:00
p.m. Please plan to
arrive by 7:30 a.m.,
so that we may begin
promptly at 8:00

Location: The Shell Auditorium,
conveniently located
downtown on the
tunnel system beneath
the lobby of One Shell
Plaza.

Price: Pre-registration
\$50.00
At the door
registration \$65.00

To Register: Please send your
name, address, phone
number and a check
to:
SIPES HOUSTON CHAPTER
811 Dallas, Suite 1416
Houston, Texas 77002
Questions? Call B. K. Starbuck @
713-651-1639

Topics

- 1) What type of work to do — Robert Pledger
- 2) Bookkeeping and tax information for the self-employed — Neil Blakely
- 3) Legal liabilities, business structure, and oil and gas agreements — Ron Moore
- 4) Intellectual property - the consequences of theft of geological ideas — Jim Pearson
- 5) Prospect generation - setting up the office and obtaining data — Ray Blackhall
- 6) How to monitor the activities of your drilling and production operator — Roger Casey
- 7) Assembling and selling prospects - what a deal screener wants to see — Scott Laurent
- 8) Computer applications for the self-employed — Deborah Sacrey

Abstract

A theoretical exposition of minimum relative entropy spectrum deconvolution (REDCON) was presented in November 1997 at the 67th Annual International Meeting of the Society of Exploration Geophysicists. The REDCON filter is derived from both a current observation of the autocorrelation function of the seismic record and an expected output spectrum for the same time-space gate. This unique filter converts the observed seismic spectrum into a practical approximation of the expected, but only if appropriate noise (energy or entropy) constraints are imposed.

Examples will be shown of some typical (marine) observed spectra.

SOCIETY OF INDEPENDENT PROFESSIONAL EARTH SCIENTISTS
Presents
A CONTINUING EDUCATION SEMINAR

“You’re On Your Own, Kid” or “Becoming a Successful Entrepreneur” (Helping the Self-Employed to Survive)

Sign me up for the May 18 SIPES Seminar!

Name: _____

Address: _____

Telephone No.: _____ Fax No.: _____

Review of GSH Visualization Conference

WHO: Will Morse
WHAT: Geophysical Society of Houston 1999 Spring Symposium 15th Annual SEG Gulf Coast Technical Meeting
 "Exploiting Immersive Environments in Oil and Gas"
WHEN: April 15-16, 1999
WHERE: Houston, Texas
WHY: Learn about various types and approaches to Visualization.

SUMMARY:

The first day was a set of talks given at the Hilton Hotel at the University of Houston. The talks were generally organized starting out to show the value of visualization in other industries and ending with more specific applications to the energy business. A large binder (really, almost a narrow bookshelf) of various papers and other materials were provided. Extra binders are available for a small fee from the GSH.

The second day was a bus tour to eight centers in Houston where this technology is in use. These centers were:

The University of Houston
Baylor College of Medicine
Rice University
Veritas
Texaco
GeoQuest,
Landmark and
Continuum Resources.

A variety of approaches were demonstrated including rear projection multi-wall presentation systems, CAVE's (Computer Augmented Visualization Environments), curved screen front projection systems, table based systems, and workstation systems.

The cost of the conference was \$150 for both days. Several organizations also contributed items to make this successful. Any money left

over goes to the scholarship fund. The organizations included:

Baker Hughes and Western Atlas: the printing costs for the proceedings

Silicon Graphics: the bus costs

Pyramid Systems: box lunches for the bus tour

Continuum Resources: soft drinks on the bus and for the reception

The conference was a huge success. One could easily pay \$1000 or more for a similar conference in other circumstances. We had the opportunity to see a wide variety of real world systems that would be hard to see in any other venue. Kudos go to the committee, which includes:

Roice Nelson	Cheyl Stevens
Shane Coperude	Scott Sechrist
Tim Hartnett	Joe Stevens
Dan Ebrom	Jim DiSiena
Bob Tatham	

SELECTED NOTES:

1. Some concepts.

"LOD", Level of Detail. The way a computer draws pictures is by drawing a polygon and filling that polygon with either a single color or with a texture. A texture is a repeating set of colors in a pattern. When the object being drawn is "close", there are a lot of polygons used to express various details. As the object goes to "far away", many of these polygons reduce to a dot, or simply disappear, and therefore the computer should not waste time trying to render these polygons.

"FOV", Field of View. A typical workstation screen occupies less than 30 degrees of the typical user's field of view. Most of the technologies discussed here occupy from 120 to 180 degrees, which involves the user more in the picture. To do this successfully requires a greater number of pixels on the screen (not JUST a bigger screen). A typical workstation screen has a resolution of 1170 by

1024 pixels. A screen capable of really managing a wide FOV would need two to three times that, at least in the horizontal.

"COTS", Common Off The Shelf. No one wants to build or code if they can find something that already covers what they need done. This leads to a lot of use of VR toolkits, authoring tools, and other products.

"POV", Point of View. It is necessary that each participant in a collaborative visualization system maintain their own point of view. This should also be communicated to others participating in the exercise. Muse has a little "craft" pointer that helps keep everyone oriented to what each participant is looking at.

"Cybersickness". When we learned about the five senses in school, they left one out. That is the ability to sense one's orientation. Virtual Reality can cause your eyes to think you are in a different orientation than your inner ears think, leading to nausea. "manifold". Not really a visualization concept, this is really more a statistical concept. It is the shape that incorporates all the points in a set of points in a volume display.

2. Types of collaborative approaches.

Doug Willie of Landmark Graphics described approaches including:

Emergency room - Two or more of every type of visualization device.

Star Trek - One person runs the show, there is a common screen but individuals also have additional workstations.

Mission Control - Several people have a large share in the control. Once again a large screen for shared information but smaller individual workstations for additional information.

Brain Surgery - one person has the whole visualization but is supported by others not "in the picture".

Conference Review continued on page 5

Group Brain Surgery - several people are in the picture and seeing each others interactions.

Lewis in Houston, Clark in Antarctica, Remotely Canoe up the Mississippi.

3. Other Industries.

The most obvious application of these types of technologies is in training. There were examples given of training astronauts, soldiers, and medical students and personnel using full feedback haptic devices (gloves and other devices that detect the wearer's movement and may provide a sense of tactile feedback). These sorts of technologies would be useful in the petroleum business for training rig crew, emergency training, flight operations crew, security personnel. Basically any kind of hands on skill where the training would be expensive, interruptive, or dangerous using real equipment.

All the examples were interesting, even fascinating, although it was not always clear what we in the exploration industry would do with these techniques.

4. Facilities.

There are many levels of this sort of technology, each with their own costs and benefits. I gathered that it is very likely that any company looking to get into this technology needs to stop thinking of it as "this technology" and start thinking in terms of specific answers for specific needs.

It is entirely possible that a single company may need some parts of the technology in one facility and other parts in another facility. The same company may need a cave AND a presentation system AND several workstations.

Just buying a Reality Monster and saying "see, we're high tech too" is not going to make it. Someone offered that "If you have to ask how much it costs, then you're not ready to buy."

I found that the CAVE has a definite 'sweet spot' and would only be really useful for at most three people (some might say six, but I think they would have to know each other awfully

well). Tables also seem to have preferred viewing directions and therefore serve a smaller number than one might think.

I was most impressed with the large circular screens, partially because of the many pixels, and therefore the ability to reasonably display a lot of information, and partially because of the software (especially at Texaco) to blend the edges of the pipes to eliminate seams in the display.

A particularly interesting display was the 3D Flat Panel from Dimension Technologies (represented by Pyramid Systems). This is a flat panel that can be viewed without using stereo glasses. My only complaint would be that the largest model is only 18" and 1280x1024 pixels. As larger flat panels become available, this could really be a strong way to handle the low end.

GeoQuest sells the Vision Dome. GeoQuest is updating GeoViz so that all the menus can appear on a second (standard) head so that you don't need to have the menus cluttering up the VisionDome, which more or less has to be on the primary head to take advantage of the graphics adapters.

5. Landmark IdeaLab

Landmark is now calling their system that used to be called "Decisionarium" "IdeaLab" which stands for Integrated Decision Environment for Asset Teams Lab. Gotta get those buzz words in. OpenVision can use multipipes, but apparently no other Landmark software can. Landmark showed a geologic cross section using about twenty logs on the curved screen. That was pretty good.

Landmark made the point that the best use of the facility was made when the participants had an agenda and knew what they wanted to see. Typical only a small part of the time typical users work do they use stereo 3D.

6. Try before you buy.

Landmark Graphics, GeoQuest, and Continuum Resources rent out their facility so you can see how it works for you before you make a big investment. There are a lot of issues

here like data privacy and so on, but each company has a different system so if you tried all three you could learn a lot.

7. Role of sound and touch, Field of View.

While several speakers stated that sound and touch (indeed, smell) were needed to fully engage the potential of the human mind to solve a problem, no one made that case very well for geoscience applications.

It was also suggested that a larger field of view is needed to bring out the genius in users, which I think is probably true for training applications, but no one really demonstrated anything I thought would make that case in geoscience applications. In fact, I thought the GoCAD demonstration on the "Immersadesk" at Rice went a long way to prove the opposite.

To really benefit from sound, touch, or FOV requires, I believe, a fairly kinematic application. Training soldiers, astronauts, oil field emergency crews, and so on have that situation. Looking at reservoirs really does not.

Will Morse is now the UNIX Guru for Anadarko, previously BHP. Will has for some years now routinely attended technical events and posted his observations and reviews to the sci.geo.petroleum.newsgroup.

He was asked if he would be willing to share his notes with the GSH for publication.

Change of Membership Status

1. Margi Oldani - AC as of 4-12-99 - Employed by Axis Geophysics
2. Zhenyue Liu - AC as of 4-12-99 - Employed by Exxon
3. Michael Rosenberg - AC as of 4-12-99 - Employed by Exxon
4. Glenn Bear - upgraded to Active on 4-9-99 - Employed by Exxon

GSH Reservoir Geophysics SIG

Date: Thursday afternoon,
May 27, 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: Bowie Room of HESS
Building 5430
Westheimer Road.
Call (713) 627-2283 if
you need more
directions.

Speakers: Dr. Zhou and Dr. Hou
from Allied
Geophysical
Laboratories,
University of Houston

Cost: NONE.

Theme:

Multi-component seismic physical modeling and depth imaging

Organizer:

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

Speaker 1:

Hua-wei Zhou
Allied Geophysical Laboratories,
University of Houston

Speaker biography:

Hua-wei Zhou is an Associate Professor in Geophysics at University of Houston (UH). He earned a BS in mathematics from China University of Geosciences in 1980, a MS in Geology from Cal State Long Beach in 1984, and a PhD in Geophysics from Caltech in 1989. After working at Exxon for over a year, Dr. Zhou returned to UH in 1998 and serves as the Associate Director of the Allied Geophysical Lab. Dr. Zhou has authored over thirty journal papers in seismology, seismic modeling, and tomography.

Presentation title:

Physical Modeling of Multi-Component Seismics

Presentation abstract:

Multi-component data provides an extra dimension to reservoir geophysics because that it records 3D particle motions of all wave modes. Such data undoubtedly contains rich information revealing the nature of subsurface geology and fluids, if we have the right acquisition and analyzing methodology. In acquisition, we are now able to acquire multi-component data in both onshore and offshore, thanks to the recent advancement in ocean-bottom-cable technology and ocean-bottom seismography. Since most processing and interpretation tools were designed for acoustic data, however, we need to strengthen our ability to analyze multi-component data. Seismic physical modeling is an effective way to assist the analysis of multi-component data, because it provides realistic data with known solutions. Using multi-component data collected from simple but meaningful physical models, we can test our ability to image the subsurface and, even more importantly, the possibility of deciphering the characteristics of reservoirs such as the fluid types and content, pore pressure, and even permeability.

This talk will use examples from seismic physical modeling conducted in the Allied Geophysical Laboratories of University of Houston to illustrate the usefulness of multi-component data. Examples include the seismic response of a porous physical model, and test results from piezo-electric films to simulate buried multi-component shots and receivers. In particular, I'll show seismic records acquired using multi-component shots and receivers over a physical model of a dome filled with air and oil. Even with such a simple model, the data contains a variety of seismic phases including direct, reflected, multiple, and converted waves as well as surface wave. The structure and air/water contact are well imaged using a combination of shear and converted waves, as shown in the next talk. Such data highlights the advantage and

limitations of using multi-component data to detect fluids in a reservoir.

Speaker 2:

Anning Hou
Allied Geophysical Laboratories,
University of Houston

Speaker biography:

Anning Hou received MS (1988) and PhD (1994) in Geophysics from Changchun University of Earth Sciences in China. He worked with the Chinese Third Division of Oil Exploration Bureau during 1982-85 and with Changchun University of Earth Sciences during 1988-94. He was a professor of Tongji University since 1996, before becoming a Research Associate at the Allied Geophysical Lab. of University of Houston in 1998. Dr. Hou has been involved in projects on wave equation modeling, migration, multi-component data processing, seismic inversion and fracture detection. His current interests include depth imaging and multi-component AVO.

Presentation title:

Multi-Component Depth Imaging with a Pseudo-Spectral Method

Presentation abstract:

Multi-component data are superior to acoustic data for a number of seismic applications, including imaging complex areas such as that involved with gas chimney and salt, reservoir characterization for lithology, porosity, and fractures, and fluid detection based on bright spot, oil/water and gas/water contacts. These applications also challenges our imaging methods. For example, very high accuracy in the computation is required at places of strong contrasts in velocity and Poisson's ratio. To satisfy the competing needs for accuracy and for speed, we developed a pseudospectral prestack depth migration (PPDM) that performs time-reversed wavefield extrapolation using the pseudospectral method. The current version of the PPDM extrapolates common shot gathers by the pseudospectral method,

ANNUAL MEETING

and

Bar-B-Que

5:00 p.m. to 8:00 p.m. on Thursday, May 13, 1999
at the St. Arnolds Brewery

**RAIN
OR
SHINE**

**Come Enjoy A Great Evening
Welcome The New GSH Officers**

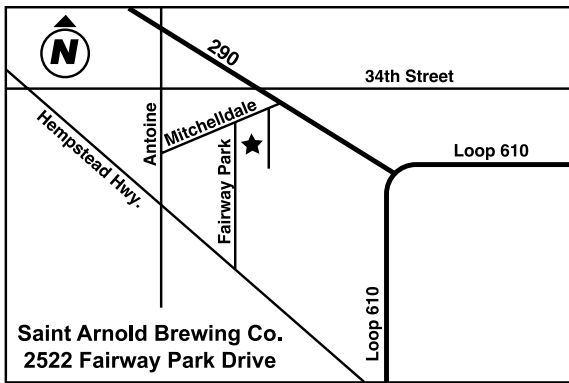


Tickets:

Only \$17.00 Each
If Purchased By May 12, 1999
\$20.00 Each At The Door

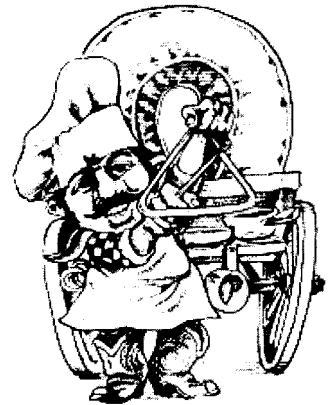
Note:

We Have To Guarantee The Number
Of Dinners, So You Must Prepay To
Be Guaranteed Your Meal.



WE WILL BE SERVING

- ☞ Draft Beer
- ☞ Bar-B-Que Brisket
- ☞ Sausage
- ☞ Chicken
- ☞ Beans
- ☞ Cole Slaw
- ☞ Bread
- ☞ Pickles
- ☞ Onions
- ☞ Soft Drinks
- ☞ Iced Tea



Annual Meeting and Bar-B-Que

Thursday, May 13, 1999

Name: _____ Phone: _____

Name: _____ Phone: _____

Number Tickets Desired: _____ X \$17.00 Each = \$ _____

Enclose Check Payable To: Geophysical Society of Houston

And Mail To:

7457 HARWIN DRIVE, SUITE 301 • HOUSTON, TEXAS 77036 • (713) 785-6403
Questions to Jim Moulden, 281-293-5711, email james.k.moulden@usa.conoco.com

Tickets Will Be Held At The Door. If Your Company Is Purchasing A Block Of Tickets - Please Indicate Names On The Form To Eliminate Any Confusion At The Door.

Ticket Orders Must Be Received By May 12, 1999 to Obtain \$17.00 Price.

Annual Honors and Awards Banquet

Thursday, May 6, 1999 • Lakeside Country Club

GSH LIFE MEMBERS / HONORARY

Art Ross • Bill Gilchrist

Leon Thomsen • Phil Schultz

SEG 50 YEAR HONOREES

Robert A. Gilmore
J. A. Keeling

Alf Klaveness
Harold F. Patterson

Edwin R. Scudday
C. L. Winn

SEG 25 YEAR HONOREES

Halbert E. Adams
Jerald M. Adams
Michael S. Adams
James L. Allen
Steven Alvarez-Wiemann
G. Leigh Anderson
Otah Don Baldwin
Jack W. Ballard
Jack R. Bantari
Pierre Benichou
Swapan Kumar Bhattacharjee
Eugene Sherwood Blasdel
Marion Ray Bone
Victor C. Boyd
Timothy S. Brown
Kenneth Bryan Butler
George Ellis Buzan
Luis L. Canales
Kenneth Walter Carlson
Arthur C. H. Cheng
Shiang-ho Cheng
Yu Taik Chon
Craig William Cooper
Lynn Allison Coyle
Richard L. Crider
Jerome S. Danburg
Robert James Davidson

A. C. Dubey
Townsend H. Dunn
Joseph K. Ellis
Warren Lee Franz
Francis M. Gardiner
David Russell Glenn
Sidney Cyrus Gold
David Edwards Graham
John Travis Griffin
David J. Hall
Ernest M. Hall
Richard J. Heaney
John R. Hopkins
Stephen Foster Hough
Daniel William Hughes
Peter Kane
Donald Curtis Lancon
William R. Landwer
Gary Lloyd Lenz
William M. Lloyd
Walter Stanley Lynn
Scott Lory Mattison
Richard Michael McCormic
James M. Medlin
James William Milliken
Dennis Gene Myers
Kenneth A. Nadolny

Michael Edward Navolio
Dianne Broadway Padgett
George Donald Pality
Adrien Paul Pascouet
Gerald Raymond Phillips
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Walter Ritchie
Gregory L. Rose
Dennis A. Rossi
Allen Ray Schmidt
Philip S. Schultz
Pedro Jose Segura
Lester K. Sisemore
Brian Starrett
Michael J. Stearns
Richard K. Stevens
Taha Mohammed Taha
George Edward Threatt
Billy Gerald Webster
Robert A. Wiener
Harvey Daniel Wilson
Michael R. Wisda
Carol J. Zimmerman

Annual Honors and Awards Banquet

Thursday, May 6, 1999

Lakeside Country Club

Honoring:
Art Ross
Bill Gilchrist
Leon Thomsen
Phil Schultz

On Thursday, May 6, 1999, the GSH will host its **Annual Honors and Awards Banquet** in the Grand Ballroom of the Lakeside Country Club. Our special guests will be your friends who have 50 and 25 years of membership in the SEG along with this year's GSH Honorary and Life Members. Bring your spouse or guest and enjoy cocktails (cash bar) from 6:30 - 7:15 pm in the Pine Lake Room. Then at 7:15 pm, enjoy an elegant seated dinner and the music of Marshall Maxwell. SEG President Brian Russell, will give the Presidential Address and assist GSH President Bob Tatham in presenting the awards.

The cost for the dinner is \$30.00 per person, with pre-paid reservations necessary to accommodate the guarantee requirements of Lakeside Country Club. Make your check payable to the GSH and forward it by April 30th to Carmen M. Comis, c/o Paradigm Geophysical Corp., 1200 Smith Street, Ste. 2100, Houston, TX 77002. Please reference "Awards Banquet" on your check.

Menu
Chicken & Leek Soup
House Salad
Salmon Poblano
New Red Potatos
Zuchinni & Squash Medley
Ices and Fresh Berries

I-10 Katy Freeway		
	Memorial	
<i>Lakeside Country Club</i>	Briar Forest	Beltway 8
Wilcrest	Westheimer	

RESERVATION FORM

Name: _____

Guest: _____

No of Guests: _____

Check No: _____

Make your check **payable to the GSH** and forward it by April 30th to:
 Carmen M. Comis
 c/o Paradigm Geophysical Corp.
 1200 Smith Street, Ste. 2100
 Houston, TX 77002

Please reference "**Awards Banquet**" on your check.

Annual Honors and Awards Banquet Member Bios

Life membership in the GSH is awarded from time to time to persons who have performed exceptionally meritorious service to the Geophysical Society of Houston. Honorary membership in the GSH is awarded from time to time to persons who have made a distinguished contribution to the geophysical profession. Nominees for Life or Honorary membership are nominated by the Nominating Committee and must have unanimous approval of the Board of Directors. Life and Honorary members have the same rights and privileges as Active members but shall not pay dues. These awards are normally presented at the Annual Honors and Awards Banquet. The names of previous awardees are listed in the annual GSH Directory.

Arthur H. Ross Jr. LIFE MEMBER

Art graduated from Boston College with a BS and from Virginia Tech with an MS in Geology. Upon graduation he commenced a 33 year career with Humble- now Exxon-and about to become Exxon-Mobil. He signed on as a hand on a shallow water - marsh seismic crew in South Louisiana. It was one of Humbles first CDP crews. After working for a little over a year his military contract came due and he served for two years as a Captain in the U. S. Army Corps of Engineers doing geology in Columbia and Panama for a Sea Level Canal feasibility study.

Returning from the service he moved to Houston and began working the Offshore Gulf of Mexico, East Coast, Scotian Shelf and Gulf of Alaska for the rounds of offshore lease sales. In 1976 Exxon reopened the district office in Corpus Christi and he moved there with his young family. While in Corpus he worked the Vicksburg trend and developed the concept of listric glide plain faulting and did extensive regional work in the Cretaceous and Jurassic of South Texas. After ten years, the district was closed and he returned to Houston doing regional

work, basin evaluation, maturation and migration pathway studies. While working in Corpus Christi he began teaching structural geology and Seismic interpretation in the company schools conducted by Exxon Production Research and continued to do so until the mid 90's. Following the formation of Exxon Exploration Co. he began working Latin America, more specifically Mexico, Colombia, Venezuela and Brazil. Presently he is involved in the Brazil Tender Round.

Art has been involved with the local geophysical societies and the SEG for most of his career. He has served as president of the Coastal Bend Geophysical Society in Corpus Christi and the Geophysical Society of Houston. He has been active with the SEG having served as arrangements chairman of several section meetings, a national meeting in Houston, technical program chairman for The Rio 95 meeting in Brazil, and membership chairman for two years. He is presently chairman of the SEG/GSH museum exhibit for the 1999 SEG Annual meeting in Houston.

Art and his wife, Marion, have two children, Nina and Chris. He has been very active with the Boy Scouts as an Eagle Scout and an adult leader as well as active in their church as a teacher and an usher.

Phil Schultz HONORARY MEMBER

Phil Schultz is a senior consulting geophysicist with Spirit Energy 76, in Sugarland, Texas, a division of Unocal Corporation. He assists exploration teams in the accurate positioning of subsurface targets through refined velocity modeling and prestack depth imaging. Dr. Schultz is also giving the SEG's second annual (1998-99) Distinguished Instructor Short Course (DISC), entitled, "The Seismic Velocity Model as an Interpretation Asset," which will be given in approximately twenty locations worldwide over the year. Prior to joining Spirit Energy, he was Principal of Schultz and Associates, a consulting firm he founded in Houston to assist clients in the management of velocity modeling for depth imaging and depth

conversion. His prior experience included a position as Vice- president of Development for Advanced Data Solutions in Houston. He spent eleven years with Schlumberger Ltd, nine of which were in overseas management assignments in Tokyo, London, and finally, Paris, where he headed development of their reservoir modeling workstation. Prior to Schlumberger, he was a research geophysicist with Digicon in Houston, where he was involved in the early development of depth migration technology and was the project manager for the extension of the Disco processing system to 3D.

He has developed a number of innovative methods in velocity analysis and 3D processing, including a simplified method for processing marine vibratory source recordings, for which he holds a patent (assigned to Schlumberger). He also developed a method for direct estimation of velocity in the near surface, for which he received the SEG's Outstanding Presentation Award. He served as an Associate Editor of GEOPHYSICS, and has served on a number of SEG and GSH committees, including Continuing Education, Development and Production, and the GSH Workstation SIG.

As an early member of the Stanford Exploration Project (SEP), directed by Jon Claerbout, Dr. Schultz's thesis on velocity estimation using "slant stacks" has the distinction of having the last single-digit SEP volume number.

Phil currently resides in Bellaire, TX, with his wife, Sandy, and their three children. He enjoys a good game of tennis.

William H. "Bill" Gilchrist LIFE MEMBER

William H. "Bill" Gilchrist began his career in our industry with a B.S. in Petroleum Geology from Texas Tech. His work experience includes the acquisition, processing and interpretation of seismic data with several companies including Robert. H. Ray, Dresser Olympic, Calhoon Consulting Co., and Exploration

Awards Bios continued on page 11

Processing. He was also a Houston marketing representative for Hampson-Russell Software. He is currently consulting and processing data as an Independent. For his distinguished contribution to the geophysical profession Bill was awarded Honorary Membership in the GSH in 1994.

Throughout his career, Bill has always found time for others—his family, church, associates, GSH and SEG—and we salute him for this. Bill is now being honored with GSH Life Membership for performing exceptionally meritorious service to the GSH. While his service to the GSH, ranging from Section Rep, Chairman of many committees to Treasurer and President, is noteworthy, he will be remembered most for fostering the education of geophysicists. His vision resulted in the first Minigeo in 1989 to allow small consultants and seismic processors to exhibit on the same footing as majors. Another vision and many long hours of work resulted in rescuing GSH artifacts from various locations and consolidating them at Hayes Information Management. Museum displays at North Harris and San Jacinto Colleges have been built by Gilcrest, together with Bill Swart. They are now working on both a display to be placed at Texas A & M and one at the upcoming SEG Convention in Houston this fall. The GSH can take great pride that our museum pieces are being viewed by so many because of the work of Gilcrest and Swart. Bill's work with students continues as he is a current instructor for the course, "Computer Workstation Modeling - AVO," at the Geoscience Technology Training Center of North Harris College.

His SEG accomplishments include being Special Events Vice-Chairman for the 1971 Annual Meeting and Arrangements Chairman for the 1986 Annual Meeting.

Leon Thomsen HONORARY MEMBER

Leon Thomsen comes by his interest in geophysics naturally: his father, Erik Thomsen, was an early

member of the SEG. Between 1938 and 1974, he found oil throughout the American southwest, and the family followed that search through thirty-five moves from Bakersfield to Tulsa to Odessa to Shreveport and to Houston. The family was in Tyler when Leon graduated from high school, and (with the help of an SEG scholarship) went west to attend the California Institute of Technology, then and now a center of excellence in geophysics. In those days, the real excitement was in plate tectonics, planetary exploration, and the constitution of the deep interior, not in hydrocarbon exploration.

So, Leon followed those ideas to Columbia University in New York City. There he met and immediately married Purnima "Pat" Gulati. In 1969, his Ph.D. thesis dealt with seismic rock properties, and represented a new way to physically interpret seismic data for clues to the composition and crystal structure of the deep interior of the earth. In a post-doc position at the Centre Nationale de la Recherche Scientifique in Paris, another back at Caltech, a consulting position with IBM, a faculty position at the State University of New York at Binghamton, and a sabbatical appointment at the Australian National University in Canberra, he used relativistic quantum mechanics to improve and refine this physical interpretation.

In 1980, during a period of high oil prices and rapid oil industry staff expansion, Leon joined Amoco's Research Center in Tulsa. Within two weeks of his arrival, he discovered that the mathematical tools and physical insight which he had acquired in his previous academic career uniquely equipped him to recognize, in exploration seismic data, the effects of azimuthal anisotropy, to interpret it, and to deal with it. Amoco had an early lead in developing these ideas because of the extraordinary intellectual environment created at Amoco's Research Center by leaders like Mike Waller, Gordon Greve, and Sven Treitel (all now retired).

Following a change of mission, in 1994, of the Amoco Technology Center Leon joined its worldwide exploration department in Houston.

Through Amoco's Multicomponent Seismic Team, Leon and his colleagues have advanced the art and science of 4-Component Ocean Bottom Seismic surveys, in gas-clouded and subsalt contexts. Following the recent merger, he serves as Principal Geophysicist in BP Amoco's Upstream Technology Group in Houston.

Leon was given the Reginald Fessenden Award in 1994 by the SEG, and served as its Distinguished Lecturer in 1997. He and his colleagues received the EAGE's Best Paper Award in 1997. He is currently Chair of the SEG Research Committee.



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)

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		

while the traveltimes between shots and subsurface imaging points are computed by two-point ray tracing. It can be applied to various types of data, such as converted waves, OBC, VSP, and Vertical Cable data. This talk will focus on the application of the PPDM on multi-component reflection data acquired over a physical model with a dome filled with air and oil. In this case, the dome structure is imaged better by the S-wave migration than by the P-wave migration. The air-water interface under the dome is imaged at the correct depth using mode-converted SPPS waves (see Figure below), again better than the P-wave section. However, the oil-water interface is not imaged well. Since the PPDM is able to deliver accurate imaging amplitudes and reasonable frequency band, we are further investigating the differences between images using PP-, SS-, and converted-waves. In addition, we are analyzing the migrated sections to study the AVO anomalies at different solid/liquid interfaces.

Update for Legislation on Licensure

The Task Force and TAPG have met, negotiated and have come up with some substitute language that should be good for everybody. Committee Substitute House Bill 34 (CSHB34) will be substituted for HB34 when HB34 is scheduled for a hearing. So far that hasn't happened. Everyone is working here to try to get Rep. Ron Wilson to schedule CSHB34 for a hearing, but so far nothing has resulted. Please write a letter to Rep Wilson. An example letter (Letter1) is posted on the web site (<http://rampages.onramp.net/~wkc/texasgeo.html>) for your convenience.

Thanks
Kevin Coleman

HOUSTON - GEOSCIENCES:

The Geosciences Forum for the Greater Houston Area

"Houston Geosciences" is a free, subscription only, electronic mailing list sponsored by the Department of Geosciences at the University of Houston. Its purpose is to facilitate interdisciplinary scientific discussion, timely exchange of information and communication among geoscience professionals in the greater Houston Area. We hope you will subscribe and contribute.

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For further information, contact Dr. Rosalie E. Maddocks, Professor, Department of Geosciences
University of Houston • Houston, Texas 77204-5503 • rmaddocks@uh.edu • (713) 743-3429



SEG 1999 Annual Meeting

**The Society of Exploration Geophysicists SEG 1999
International Exposition and 69th Annual Meeting
October 31 - November 5**

George R. Brown Convention Center, Houston, Texas

The SEG Global Marketplace offers exhibitors opportunity and demonstrated success. By exhibiting at the SEG International Exposition, your company can tap the buying power of professionals from energy, mineral and mining industry firms from around the globe.

Whether you are introducing a new product or service, or wish to expand your company internationally, this is the single source to meet your marketing needs.

The International Exposition and Sixty-Ninth Annual Meeting will be held in the city of Houston at the George R. Brown Convention Center October 31 to November 5, 1999. The Exposition will run Sunday October 31 until Wednesday, November 3, 1999.

Booth Assignment

Booths will be assigned in the exhibit hall using the Priority Points System.

Points are awarded for corporate membership in the SEG, previous exposition participation, advertising placed in SEG magazines, The LEADING EDGE and GEOPHYSICS, and by booth size (yes, size matters!).

Contacts

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Email: semery@seg.org

Bob Lewis

Manager Meetings & Expositions
Phone: 918-497-5518
Fax: 918-497-5557
Email: blewis@seg.org

IMPORTANT DATES

July 26	Deadline for Ads in the convention issue of The Leading Edge magazine
July 1	Deadline for advertising in the Official Program and Exhibitors Directory
June 15	Approx Housing and Registration forms mailout
July 15	Approx Service Manual mailout
October 27	noon Move in begins
October 31	Exposition and Annual Meeting

Continue to view the SEG website at www.seg.org for additional information and updates on exhibiting at SEG Houston '99."



Golf Tournament and Dinner Geophysical Society of Houston



DATE: Monday, May 24, 1999	FORMAT: Four Man Florida Scramble
PLACE: Kingwood Country Club	COST: \$110.00 Members and Guests
TIME: 8:00 AM Registration 10:00 AM Tee off (Shotgun)	DEADLINE: April 15, 1999

MAIL ENTRIES TO:

Fairfield Industries • 14100 Southwest Freeway, Suite 600 • Sugar Land, TX 77478 • Attn: George Lauhoff

MAKE CHECKS PAYABLE TO:

Geophysical Society of Houston

GOLFERS READ CAREFULLY

The three courses at Kingwood are available to the first 432 entrants. No entry will be accepted until the entry form and fees are received in full. **NO EXCEPTIONS!!!**

MULLIGANS \$5.00 EACH (MAX. 2/PERSON) AVAILABLE AT CHECK-IN

If you are not playing golf but want to join your friends attending the dinner following the tournament, please send in \$15.00 per person to cover the cost of the dinner. Make a note at the bottom of the check "Dinner Only". These checks should also be payable to the Geophysical Society of Houston.

GOLF TOURNAMENT FORM

You may select your own foursome, if not you will be assigned to a group. The first name listed will be considered the TEAM SPOKESPERSON.

Name: _____ Name: _____

Circle: Member Guest Circle: Member Guest

Company: _____ Company: _____

Phone: _____ HDCP: _____ Phone: _____ HDCP: _____

Name: _____ Name: _____

Circle: Member Guest Circle: Member Guest

Company: _____ Company: _____

Phone: _____ HDCP: _____ Phone: _____ HDCP: _____

Course Preference: ISLAND LAKE MARSH DEERWOOD
(Circle One)

Worldwide Technology Forum

May 10-12, 1999
Adam's Mark Hotel
Houston, Texas



During this three-day event, technology tracks will focus on innovations in the use and application of technology, as well as emerging technology trends. Technical and Case Study presentations, panel discussions and update sessions will follow these technology tracks:

**Shared Earth Modeling:
Revolution in the White Space**

**Advances in Integrated
Interpretation and Processing:
Reshaping the Industry's Future**

**Integrated Information
Management: Driving the E&P
Decision Chain**

**Immersive Technologies:
Enabling Collaborative Teams**

**Reservoir Management and
Simulation: Strategies for a
Complex World**

**Advances in Integrated Well
Planning, Drilling, and
Production Monitoring: Bridging
the Gap**

**The Economies of Knowledge:
Managing Your Virtual Assets**

**Advances in Computing
Environments: Looking Over the
Horizon**

Landmark invites you to attend the 1999 Worldwide Technology Forum, May 10-12, 1999 at the Adam's Mark

Hotel in Houston. This annual conference provides a unique forum focused on enabling you to gain the greatest business and technical value from Landmark's spectrum of integrated solutions systems, software, and services.

This is the only event of the year in which you'll have the opportunity to see virtually everything Landmark has to offer, as well as exchange information with your peers, our software developers, and industry experts. For years, attendees have told us the Forum has become a vital part of their professional development and strategic planning.

The theme of the 1999 conference is "Beyond the Boundaries." We'll address an array of significant information technology breakthroughs that are creating the new economics and reshaping our industry as we approach the next millennium. Our agenda includes technical presentations and case studies, panel discussions, update sessions, exhibits, and demonstrations by Landmark, GeoGraphix, Halliburton, and many third-party representatives.

Targeted sessions throughout the three-day conference will provide valuable, relevant, and up-to-date information for E&P and IT professionals at the executive, management, and technical levels.

Regardless of where your primary interest lies, we hope you'll join us for

Landmark's sixth annual Worldwide Technology Forum.

**Three easy ways to register...
Registration Information**

There are three easy ways to register for the 1999 Worldwide Technology Forum mail, fax, or electronically. To register electronically using your credit card, see <http://www.cmsusa.com/landmark/>. If you do know someone who does not have access to the internet, please e-mail their name and complete address to forum@lgc.com and a registration packet will be mailed to them. Complete a separate form for each person registering from your company.

**Registration Changes and
Inquiries**

Registration changes and inquiries should be sent to:

1999 Landmark WWTF
911 Busse Highway
P.O. Box 998
Park Ridge, IL 60068
Fax: (800)813-3459 or
(847)698-9245 if outside the U.S.
Phone: (800)823-1532 or
(847)384-7729 if outside the U.S.
Monday-Friday, 8:30am-5:00pm,
Central Time.

To avoid duplicate charges to credit cards, DO NOT mail a copy of your registration form once it has been faxed or submitted via the worldwide Web.

MAY 1999

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
						1 HGS Bass Tournament
2 HGS Bass Tournament	3 OTC '99	4 OTC '99	5 OTC '99 Career Decision Workshop	6 GSH Annual Honors & Awards Banquet	7	8
9	10 HGS Dinner Meeting Worldwide Technology Forum	11 Worldwide Technology Forum	12 Worldwide Technology Forum	13 GSH Barbeque GSH Technical Luncheon	14	15
16	17	18 SIPES Continuing Education Seminar	19	20 HGS Emerging Technologies Dinner Meeting	21 HGS Tennis Tournament	22
23	24	25	26 HGS Luncheon Meeting	27 GSH Reservoir Geophysics	28	29
30	31					

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