



# Geophysical Society of Houston

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NEWSLETTER

MARCH 1998

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## Joint GSH-HGS Technical Dinner

**Date:** Monday, March 9, 1998  
**Time:** 7:00 p.m.  
**Location:** Westchase Hilton (9999 Westheimer)  
**Cost:** \$20 for pre-registered members; \$22 for guests, \$25 at the door  
**Reservations:** Call (713)-917-0218, or email [reservations@hgs.org](mailto:reservations@hgs.org) - No later than Thursday, March 5, 1998  
**Speaker:** Dr. Virgil L. Sharpton, Lunar and Planetary Institute, Houston, Texas  
**Topic:** Structure of the Chicxulub Impact Basin

**Abstract:**  
 The collision between a large extraterrestrial object and Earth 65 million years ago in the Yucatan led to the extinction of about 70 percent of the planet's species, including all dinosaurs, at the end of the Cretaceous Period. The Chicxulub impact basin on the northern coast of Yucatan appears to be the site of this catastrophic impact event.

The crater is completely buried by Cenozoic platform rocks and so conventional geophysical techniques and drilling must be employed to study the style and extent of deformation

associated with its formation. Bouguer gravity anomalies indicate a configuration of multiple concentric rings, the largest of which has a diameter of nearly 300 km. Recently acquired seismic data substantiates this morphology and delineates in remarkable detail the smaller central basin, formed by inward slumping of the excavation crater walls, has a diameter of nearly 200 km and modest extensional deformation extends to approximately where the outer gravity ring is located.

Stratigraphic and paleoenvironmental constraints derived from deep exploration drilling by Pemex and shallow drill coring by UNAM indicate that the higher standing topography associated with the inner basin flanks has undergone substantial reworking. Large blocks, some exceeding 50 m in thickness, were ejected more than 70 km from the edge of the excavation cavity. The breccias and melt rocks are mixtures of Pan-African crystalline rocks and Cretaceous sediments. The abundance of anhydrite and carbonate in the platform section melted and vaporized by this impact event may have contributed to the destructiveness of this impact.

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**email: reservations@hougeo.org • website - http://www.seg.org/sections/gsh/gshhome.html**

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## Editor's Notes

To insure your information reaches all GSH society members in a timely fashion it must appear in the appropriate newsletter issue. Please check our deadlines and plan your function's publicity strategy accordingly. The newsletter editor must receive materials on or before the corresponding content deadline date.

### Remaining 1998 GSH Newsletter Deadlines

Issue ..... May, 1998  
**Deadline ..... March 19, 1998**

Issue ..... June, 1998  
**Deadline ..... April 16, 1998**

Content deadlines occur approximately six weeks prior to publication, usually on the third Thursday of the month..

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## Technical Luncheon

Chair - Phil Hosemann, 713-655-9838, 713-655-7301

Date: Monday March 16 , 1998  
Time: Register and cash bar, 11:30 AM ; Luncheon and Talk 12:00 Noon  
Location: NEW Hess Building, 5430 Westheimer Formerly the Carlyle Restaurant located on the north side of Westheimer between Chimney Rock and Yorktown.  
Cost: \$20 for pre-registered members; \$25 for walk-ins and guests  
Reservations: Call (713)-917-0218 and use the reservation code 6-0-1. Or email reservations@hgs.org No later than 11am, Thursday, March 12, 1998  
Speaker: Stuart W. Fagin, PhD  
Topic: Time-Depth Conversion in the 21st Century

### Abstract:

Time-depth conversion has been a necessary geophysical task since the inception of the seismic reflection method. In past decades an array of approaches has been devised by explorationists which respond to the specific challenges presented by different geologic-velocity regimes. However, specific developments in recent years, having to do with new analytic procedures and with advances in the workstation environment, provides motivation for taking a fresh look at this traditional geophysical endeavor. This presentation will discuss several areas of current concern in time-depth conversion and also the technical trends that will impact them.

(1) Database: A properly constructed velocity database sets the stage for efficient and effective velocity analysis. Relational velocity-database software systems allow well and seismic information to interact in accordance with their respective geophysical roles.

(2) The use of statistical tools for data quality control: Data quality control may constitute the single most time consuming task in time-depth conversion. Particularly important is the reconciling of conflicts in where geologic surfaces are identified in the well and where they are identified in the seismic volume. Statistical tools, and in particular crossplotting, allow the interpreter to quickly identify problem areas.

(3) Identifying the geologic-velocity regime and devising the proper velocity mapping and modeling strategy: The subsurface velocity field is influenced by a combination of age, depth, lithology, and pressure. The velocity mapping method which is most appropriate for a basin is determined by the combination of these factors which are most important; a particular combination of these factors implies a particular set of velocity mapping methods. The guiding principle is to devise a strategy which enables the mapping of velocity within a low-variance framework.

(4) The role of geostatistics in time depth conversion: Geostatistics analysis

plays three key roles in time depth conversion. (1) It provides an analytic basis for interpolation and gridding, (2) It provides a systematic procedure for integrating different data types for velocity mapping, and (3) It provides a measure of uncertainty. The first two roles result in more accurate velocity and depth maps, while the last enables an assessment of prospect risk.

(5) The impact of visualization technology: The visualization afforded by modern workstations has two impacts on time-depth conversion. First, because the workstations enable the visualization of the entire velocity volume, velocity models can be constructed using instantaneous velocity rather than interval velocity. Instantaneous velocity is preferred, because it can be more closely associated with geologic structure and stratigraphy. This is particularly true in a highly depth-dependent geology-velocity regime. Second, visualization enables volume-based, rather than surface-based model construction.

### Biography:

Dr. Fagin is the vice president of Interpretation Technology for Paradigm Geophysical Corporation and Product Manager of GeoDepth EarthModel and GeoDepth Explorer. In his role, Dr. Fagin facilitates the transfer of seismic interpretation and depth imaging technology to the petroleum industry through the presentation of workshops, lectures and technical articles. As vice president of technology, he guides the development of new model based depth imaging products and services.

Dr. Fagin is the author of the SEG volume, "Seismic Modeling of Geologic Structures". Dr. Fagin has 13 years of experience, having worked for Exxon Production Research Company and Exxon Exploration Company. His research at Exxon involved investigation of the seismic definition of geological structures with particular emphasis on seismic modeling. He received his Ph.D in geology from the University of Texas in 1983. Dr. Fagin is also a lifetime honorary member of the Geological Society of Houston.

## Technical Breakfast

Chair - Scott Sechrist, 281-856-8029,  
fax 281-856-7445, email:  
acoustic@neosoft.com

Technical Breakfasts are scheduled monthly, on the Wednesday of the second full week of each month: Apr. 15; May 13; June 10 (possible).

Please contact Scott for further breakfast information or to suggest potential topics and speakers.

Breakfast Date: Wednesday,  
March 11, 1998  
Location: Wyndham Greenspoint  
Time: Breakfast from 7:00 -  
7:45 a.m.; Speaker  
from 7:45 to 8:15  
a.m.; Meeting ends by  
8:30 a.m.

Cost: Free  
Host Company: GSH members wish to express their appreciation to Exxon management for once again graciously providing both the location and a continental breakfast to all attending at no charge.

Reservations: Reservations should be made with the GSH office by 4 pm on Friday March 6, 1998 .

Subject: Seismic Responses for Deep-Water Exploration Plays

Speaker: Mark Wilson,  
Geophysical  
Development  
Corporation

Abstract:  
Seismic Responses for Deep-Water Exploration Plays

Richard Verm, Mark Wilson, Peg Guthrie and Luh Liang  
Geophysical Development Corporation

What Direct Hydrocarbon Indicators (DHI's) should one expect in the Gulf of Mexico deep-water area? Would AVO processing reduce the exploration risk? In order to answer

these questions, a petrophysical study of 400 deep-water wells was conducted and the derived elastic properties were cataloged with respect to rock type, pore fluid properties, pressure, age, geographic location and depth below ocean bottom.

Realizing the need to validate any seismic predictions from regional rock-property statistics, PP ray-tracing AVO models were generated for 100 wells for comparison. Both in-situ and fluid replacement AVO synthetics were produced along with the lithologic calibration of the AVO attributes for over 40 GOM deep-water fields. In addition, six wells were chosen for full elastic modeling to validate the usage of PP AVO modeling to predict the "true" seismic response. The elastic modeling demonstrates the problem of extracting reliable AVO information in sequences prone to geologic noise such as surface and inter-bed multiples and mode conversions. Exploration solutions such as mapping the P-S conversions and calibrating non-hyperbolic signals to lithology were also examined.

These predictions were then applied to different depositional models for comparison to the various attribute sections normally derived from conventional AVO and DHI processing. In essence, the stack and CDP responses were combined with the AVO seismic attribute sections to better understand the deep-water exploration plays.

### BIOGRAPHY:

Mark Wilson is a geophysicist and log analyst at Geophysical Development Corporation. After receiving a Bachelors degree in Geology from Stephen F. Austin State University in 1982, he joined Geophysical Development Corporation in 1984. He has served as Project Manager on over 15 GOM Log Analysis Projects (LAP) consisting of 250 wells each. Mark is responsible for special projects involving AVO analysis of well logs for prospect evaluation and seismic data calibration. He also has directed GDC's Deep Water Projects Phase I and II. Mark is a member of SEG.

## SIG Announcements

### Interpretation SIG

SIG Chair - Larry Godfrey, 281-499-6068, email lgodfrey@intertex.net

The Interpretation SIG will announce four meetings throughout the coming year on topics concerning Technology for Interpretation. Larry is actively seeking volunteers to serve on the Interpretation Committee. These volunteers could help to organize meetings, contact and schedule potential speakers, arrange venues, etc. If you are interested in helping out, please contact the SIG Chairman, Larry Godfrey.

Contact Larry Godfrey for information about SIG activities.

### Data Processing SIG

SIG Chair - Young Kim,  
713-966-6156, 713-966-6333,  
young.c.kim@exxon.sprint.com

The Data Processing SIG has scheduled nine monthly meetings for the coming year with themes for each of the meetings as listed below. The meetings are scheduled from September 1997 through May 1998, with two speakers at each meeting. The selected dates and topics are:

3/18/98  
Anisotropy  
Chengbin Peng\*, Richard Verm

4/15/98  
Multiple attenuation  
Jerry Kapoor\*, Richard Verm

5/20/98  
Traveltime calculation for depth migration  
Ilkka Noponen\*, Karl Schleichler,  
Jerry Kapoor  
\* denotes the primary organizer

*Data Processing continued on page 5*

## March Meeting

Date: Wednesday March 18, 1998

Time: Social 4:30 p.m.; presentations 5:00 to 6:30 p.m.

Location: BTC Lecture Hall; Shell E&P Technology Co., 3737 Bellaire Blvd

Directions: From the west, take 610 west loop south, exit at Bellaire Blvd, turn left onto Bellaire Blvd. Drive towards downtown. Pass railroad tracks, pass Stella Link, you will see a shopping mall on your right. After next traffic light, you will see the Shell Research Lab. Please park your car outside the building, either at 3747 or 3737 street addresses. Proceed toward the entrance at 3737 and a receptionist will direct you to the Lecture Hall. Call 713 245 7240 if you need more directions.

Cost: NO COST

Topic: Anisotropy

Organizers: Chengbin Peng\*, Richard Verm

Speaker 1: Chengbin Peng and Jorge Lopez, Shell E&P Technology Co. and Kurt E. Steenson, Shell Western E&P Inc.

Title: Getting Anisotropy Right for Depth Migration — A case study at Lodgepole play in North Dakota

### Abstract:

For time related seismic processing, the short spread NMO velocity and the eta (related to the difference of Thomsen's epsilon and delta) are two key parameters for proper imaging. For depth migration, however, a detailed laterally varying velocity model and anisotropy specifications are needed.

In this talk, we will show a case study at the Lodgepole reef play in North Dakota. The reefs or mounds are

approximately 1000 ft in width and 100 ft in height, at a depth around 9800 ft. The reefs are filled with 45 API oil, with average per well production over 2000 BOPD.

Direct seismic expressions of the reefs are hard to find. Key attributes used in the exploration are the isotime thickness between the Bakken shale marker beneath and the Base Last Salt event above as well as changes of reflection amplitude of the Bakken shale event. Conventional time processing produces a lot of false structures that render interpretation difficult.

A 3D velocity model was built for depth migration, using existing well controls and interpreter's horizon maps. A 3D ray tracing modeling using the exact shot and receiver coordinates showed that, for all events interpreter identified, the modeling results overlay with the real data extremely well for short offset. As the shot-receiver offset became large, the modeling results were much slower in time than real events. Including 25% epsilon and 12% delta in the shallow part of the model (Niobrara, Greenhorn, Muddy, and Dakota intervals), a massive shale package, yielded excellent modeling results compared with real data, for all events and all offsets. Prestack depth migration with the 3D anisotropic velocity model produced sections with little time structures. The depth of Bakken event in depth migrated section agrees with well tops within 50 ft. The common image point gathers were flat.

### Biography:

Chengbin Peng received a BS (1985) in geology from Beijing University and a PhD (1993) in geophysics from Massachusetts Institute of Technology. He worked for Shell since 1991 at Shell Offshore Inc in New Orleans and Shell Development Co in Houston. He is presently a senior research geophysicist at Shell E&P Technology Co. His interests are depth migration, velocity updating, anisotropy determination, and reservoir characterizations. He is a member of SEG, EAGE and AGU.

Speaker 2: Steven L. Roche\*, Thomas L. Davis and Robert D. Benson, Reservoir Characterization Project (RCP), Colorado School of

Mines. (\* presently with Input/Output, Inc.)

Title: 4-D, 3-C Seismic Study at Vacuum Field, New Mexico

### Abstract:

A time-lapse (4-D), multi-component (3-C), seismic survey was acquired, processed and interpreted in conjunction with a CO2 Huff-n-Puff EOR project at Vacuum Field, New Mexico. The CO2 injection program induced bulk rock property variations due to pore pressure changes and fluid saturation changes associated with reservoir production processes. Data acquisition procedures and data processing methodology for time-lapse, multicomponent surveys were developed. Interpretation of P-wave and S-wave data volumes indicates detection of bulk rock property variations is possible using surface seismic data. Integration of the 4-D, 3-C seismic data with reservoir production data and geologic well control provides an interpretation of the gross permeability structure of the reservoir.

### Vacuum Field and Data Acquisition

Central Vacuum Unit of the Vacuum Field is located in Lea County, New Mexico. Production is from San Andres and Grayburg dolomites at an average depth of 1370 meters. Lithology is primarily dolomite with an average porosity of 11.6% and an average permeability of 22.3 md. Central Vacuum Unit has been under waterflood since 1978 and is presently maintained above bubble point pressure. A carbon-dioxide (CO2) Huff-n-Puff (cyclic CO2) enhanced oil recovery process was implemented in the Texaco CVU #97 well at the center of the 4-D, 3-C survey area. The time-lapse (4-D), 3-C surveys were acquired immediately before and after CO2 injection. An Input/Output System II recording system was utilized, recording 2508 channels at 2 msec sample interval. The recording spread was stationary with 836 3-C receiver stations. Source lines were orthogonal to the receiver lines and each source location was occupied three times (one vertical and two horizontal actuated

vibrators) to provide three orthogonal components of force imparted to the earth's surface.

#### Data Processing

A processing flow was developed to maximize resolution while maintaining repeatability by deriving and applying appropriate corrections between surveys to allow minimal data dependent processes. Five of the 9-C components were processed, the vertical source - vertical receiver component volume (P-wave) and the four horizontal component shear volumes (S1, S2, D1, D2) rotated to an S1 (fast S-wave) and S2 (slow) azimuthal, anisotropic (HTI) coordinate system. The five P-wave and S-wave volumes were processed for both the initial and repeat surveys.

#### Interpretation

The multi-component seismic data volumes were interpreted for a temporal response related to the changes in bulk rock properties due to the changing reservoir conditions. There are observed variations in P-wave reflection amplitude and changes in S-wave polarization. We believe these time-lapse seismic anomalies observed between initial and repeat surveys are associated with changes in pore fluid properties and effective stress changes due to pore pressure variations.

Polarization of S-wave data provides information related to the velocity anisotropy of the bulk rock properties. Variations in pore pressure, which can affect the percentage of open fractures and low aspect ratio pore structure will affect the degree of S-wave splitting. A residual rotation analysis was performed on both the initial and repeat survey S-wave data. Changes in polarization angle appear to be associated with changes in reservoir pressure at well #97 and the water injection wells #93, #194, #94, #99 and #100. A plausible interpretation is the increase in pore pressure has opened more fractures, micro-fractures and low aspect ratio pore structure that affect the S-wave polarization. The areal distribution of S-wave anisotropy correlates with the percent water cut production map and other reservoir

production indices.

#### Conclusions

We have successfully acquired, processed and interpreted an onshore, time-lapse (4-D), multicomponent (3-C) seismic survey in conjunction with a CO2 injection program in a shallow carbonate shelf reservoir. Time-lapse seismic anomalies associated with bulk rock property changes due to reservoir processes have been detected using surface seismic data. Vp/Vs ratios correspond to production characteristics of the reservoir and indicate delineating the permeability structure of a carbonate reservoir is possible using multicomponent, 3-D and 4-D seismic data.

#### Acknowledgments

The authors thank the Industry Sponsors of the Reservoir Characterization Project (RCP) at the Colorado School of Mines for the continuing support of our research.

#### Biography

Steve Roche received a BS (1978) in geophysics from the University of California at Riverside. He worked for Geophysical Service, Inc. and Halliburton Geophysical Services through 1993. In 1994,

Steve attended Colorado School of Mines, working within the Reservoir Characterization Project, and received a Ph.D. in 1997. He is presently with Input/Output, Inc. as a geophysicist. Interests include multicomponent data acquisition, processing, reservoir characterization and reservoir monitoring.

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## Potential Fields SIG

SIG Chair - Chuck Campbell of Accl Services (713-993-0671 or email at [campbell@neosoft.com](mailto:campbell@neosoft.com))

The Potential Fields SIG plans to have 1997-98 meetings every other month, from September to May (September, November, a holiday party in December, January, March, and May). Meetings typically consist of a social hour, dinner, and technical presentation. Anyone interested is

invited to attend. For information about meeting times, locations and speakers, please contact the SIG chairman, Chuck Campbell.

Date: Thursday, March 19, 1998  
Time: 5:30 - Social Hour, 6:30 - Dinner, 7:30 - Talk  
Location: Hess Building, 5430 Westheimer - Located on the north side of Westheimer between Chimney Rock and Yorktown.  
Cost: \$20.00  
Topic: Gravity Gradiometry Case History over Gemini Field, Mississippi Canyon  
Speaker: John Prutzman, Bell Geospace  
Reservation: RSVP by 3 pm., Mar. 18th. to: Chuck Campbell, ACCEL Services, Inc. [campbell@neosoft.com](mailto:campbell@neosoft.com), or 713-993-0671

#### Abstract:

Stealth technology, first used to navigate nuclear submarines, now offers the oil industry an another independent way to constrain 3D seismic interpretations. The full tensor gradiometer has very high sensitivity and is able to capture meaningful high spatial frequency data, much higher than available from existing gravimeters. All nine gravity gradient tensors are measured producing a complete characterization of the gravity field. Measured full tensor gradient data gives information on edges, corners, depth, and axis of mass anomalies, which is important interpretation information. A test project integrating full tensor gradient data with depth converted 3D time migrated data was designed over the well-imaged Gemini Field, Mississippi Canyon. The initial geologic model suggested the pay horizons were truncated against allochthonous salt. This model was tested by calculating gravity and gradient data for the model and comparing the results to the Bell Geospace gradiometry data. The differences between the simulated and

measured data were used to re-interpret the 3D seismic data and modify the geologic model until the differences were significantly reduced. The revised model interpreted the pay horizons as part of a broad subsalt anticline. The full tensor data also suggested the base of salt was as much as 1250 feet deeper in some areas. The revised model also had significant improvements in density, particularly in the shallower layers. The Gemini test project shows that full tensor gradiometry provides an important independent constraint on the 3D seismic data, particularly in areas of poorly imaged seismic reflectors caused by overlying structural and stratigraphic complications.

**Biography:**

John Prutzman is currently a Senior Geoscientist with Bell Geospace where he has been involved in the Gemini project and software development. Previously he spent two years at Landmark Graphics developing training courses for all the geophysical interpretation products as well as writing integrated software training and custom courses. He has broad domestic and international industry experience including seismic interpretation and processing, field work, integrated studies using sequence stratigraphy, and other special projects. He holds an MS degree in geophysics from the University of Minnesota.

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**Near Surface Geophysics SIG**

SIG Chair - Tom Dobecki, with Fugro-McClelland (713/778-5505)

**March Meeting**

Date: Wednesday, March 18, 1998  
 Time: Social 5:30 pm; Presentations 6:30-7:30 pm  
 Location: Fugro Building, 6100 Hillcroft (corner Hillcroft and Gulfton), Room 160  
 Cost: NO CHARGE  
 Topic: Archaeological Applications of Near

Surface Geophysics  
 Speaker 1: Joe Austin, Earth Measurement Corporation  
 "Geophysical Search for the Lost Water Well at the Alamo, San Antonio"  
 Speaker 2: Tom Dobecki, Fugro-McClelland (Southwest), Inc.  
 "Geophysical Surveys of the Great Sphinx and Pyramids of Egypt"

Contact Tom Dobecki for additional meeting information.

Activity Report: Liaison to Citizens Environmental Coalition (CEC)  
 From: S. Hrabar

The 14 January CEC Delegate Meeting was cancelled. However, the CEC invited interested delegates to an open house from 11 am-2 pm on Tuesday 20 January at 3015 Richmond Avenue. The purpose was to consider becoming part of an Environmental Conference Center comprised of CEC member organizations.

For years the CEC talked about a physical place where several organizations could office and share board and conference space as well as communications resources. The Upper Kirby District bought the old Mexican Consulate at 3015 Richmond. The District will operate the building and plans to rent strictly to nonprofit organizations. The building contains 20,000 sq. ft. It will have a conference center capable of holding 150 people in theater-style seating and smaller meeting rooms. These could be used for luncheons, seminars, conferences, and workshops.

The next scheduled CEC Delegate meeting will be in March.

Those interested in further information should contact S. Hrabar at:

stephaniehrabar @ internetMCI.com

**Reservoir Geophysics SIG**

SIG Chair - John Eastwood - Exxon Production & Research Co., P.O. Box 2189, 713/966-3196, 713/965-7309 (fax), john.eastwood@exxon.sprint.com.

**March Meeting**

Date: Thursday, March 5, 1998  
 Time: Social 4:00-4:30 pm; Presentations 4:30-6:00 pm  
 Location: Exxon Production Research, 3120 Buffalo Speedway, Room S-202  
 Cost: NO CHARGE  
 Topic: Time-Lapse Reservoir Monitoring  
 Speakers: Dave Johnson, EPR, "Time-lapse Seismic Analysis of the North Sea Fulmar Field." Xuri Huang, Western Geophysical, "Production History Matching with Time-lapse Seismic Data." John Eastwood, EPR, "Application of Simulated Annealing for Reservoir Monitoring."

**GSH Ladies Auxiliary Calendar of Events**

**March, 1998**

"The view from within" Tour+Lunch; Inside access to downtown Houston. Contact Roshan Agarwal of the Ladies Auxiliary for information.

**April 19, 1998**

Museum of health evening with the director, includes Dinner, Video, and Guided Tour.

ALL SEG MEMBERS, SPOUSES AND GUESTS are invited at an auxiliary price to attend any function - contact Donna Parrish at 281-785-7115  
 Annual Auxiliary Membership Dues \$10



## Candidates for the GSH 1998/1999 Executive Committee:

### President Elect:

*Pat Starich*

*Pat Peck*

### First Vice President:

*Lloyd Weathers*

*Dan Ebrom*

### Second Vice President:

*Jock Drummond*

*Joel Starr*

### Secretary:

*Bob Bruce*

### Treasurer:

*John Freeland*

### Editor:

*Jess Kozman*

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## Honors & Awards Banquet

Thursday Evening, May 7th, 1998  
Lakeside Country Club,  
Guest Speaker, Rutt Bridges, SEG  
President  
Music by Marshal Maxwell

Preparations are underway for the 1998 GSH Honors and Awards Banquet. As in years past, the GSH takes great pleasure in honoring Silver and Gold members of the SEG and those members of the GSH who have contributed to the advancement of the geophysics. We hope that you will make plans to attend this time honored event. Dress is semi-formal, black tie optional. For more information, please contact Carmen Halvorsen Comis, Awards Banquet Chairperson, 713-465-6612, ext. 109, or [carmen@double-precision.com](mailto:carmen@double-precision.com).

## HGS and GSH Presents the First Annual 3D Seismic Symposium

### 3D SEISMIC—DESIGN, ACQUISITION, AND PROCESSING

Date and Time: Tuesday, April 14, 1998, 8:00 a.m. to 5:00 p.m.

Location: Western Geophysical Building, Auditorium, 10001 Richmond Ave., Houston, Texas; at the southwest corner of Richmond and Briarpark. Free parking is available in the parking lots off Briarpark. Please enter through the main entrance of the building and see the receptionist.

Instructors/Topics: Marc Pottorf, Geotrace: Acquisition Design Vs. Cultural? Obstacles—The Best Compromise; R. Daniel Wisecup, Western Geophysical: How Acquisition Strategies with Similar Efforts & Cost Can Produce Remarkably Different Results; Wulf F. Massell, EPIC Geophysical: Matching the Acquisition Design & Processing to the Exploration Objectives; and James L "Jim" Allen, Mayne & Mertz: At the Mercy of the Processors.

Discussion Moderator: Jozica H. Gabitzsch, Processing/Acquisition Geophysical Consultant

Price: In Advance: members: \$50, non-members \$60, by Friday, April 10, 1998

At the Door: members: \$65, non-members \$75. Full Time Student: \$25.

To Register:

Send check (payable to the Houston Geophysical Society) to:  
HGS, 7457 Harwin, Suite 301, Houston, Texas, 77036-2190, or call  
the HGS/GSH Office 713/785-6402

Course Description: 3D is preferred to 2D, everybody knows about it and is using it. OK, so the battle over the usefulness and necessity of 3D seismic is pretty well over and 3D has won a knockout. 3D might have won, but where are you, the struggling geologist or geophysicist, when faced with the plethora of new and frightening buzz words and even more frightening budget busters? How do we tame the unruly beast and force it to do our will armed with our increasingly insufficient knowledge and a simple sling shot with but one stone to throw. Careful now, the stone's name is DAP (Design, Acquisition, and Processing) and a miss can cost your company literally millions as well as that fat bonus you were savoring.

After the speakers have given their presentations, Jozica Gabitzsch, Geophysical Consultant, will moderate an afternoon round-table discussion. The speakers will answer questions from attendees as well as probe the differences in the various design, shooting, and processing ideas presented.

This will be a useful course for anyone using, shooting or processing 3D Seismic. 3D Design, Acquisition, and Processing will look at the different design schemes from single to quadruple brick to diagonal, bump that with the practicality of the field environment, and assess all of this in the final processing.





**Gulf Coast 1998 Spring Symposium**  
 on  
**Deep Water Exploration**



Sponsored by  
 Society of Exploration Geophysicists  
 and  
 Geophysical Society of Houston

**Thursday, April 30th 1998**  
 Marathon Conference Center • 5555 San Felipe, Houston, TX

PROGRAM

**Morning Session:**  
 Technology Foundation  
**Rock Property Framework for Comprehending the Deep-Water Seismic Response**  
*Fred Hilterman, Vice-President of Development,*  
*Geophysical Development Corporation*

Invited Papers  
 — GEOPHYSICAL ANALYSIS DIRECTED AT DEEP-WATER PROSPECTING  
 (including: depth imaging, geopressure prediction and amplitude vs. offset)

**Afternoon Session:**  
 Technology Foundation  
**Stratigraphic Framework for Deep-Water Sand Prospecting**  
 Roger Slatt, Professor and Department Head, Depart. of Geology  
 and Geological Engineering., Colorado School of Mines

Invited Papers and Panel Discussion  
 — INTERPRETATION EXPERIENCE TARGETING DEEP-WATER PROSPECTS  
 (including: case-studies, strategies and the role of the team)

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Attendance is limited so please look for more details and make reservations at:  
<http://gulfcoast98.seg.org> or GSH Office Fax: (713) 785-0553

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name	phone #	fax. # (important)	company
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signature	credit card	credit card number	(exp. date)
Registration: paid by April 15th	\$60.00	for GSH Members	_____
paid by April 15th	\$80.00*	for non-members	_____
(at the door)	\$100.00)	Total Charge:	_____

\* \$20.00 applies towards first-time membership in the GSH

First Announcement  
 14th Annual SEG Gulf Coast Technical Meeting • GSH, 1998 Spring Symposium

**Deep Water Exploration**  
 April 30th, 1998 at Marathon Conference Center • 5555 San Felipe, Houston, TX



## Biography

Dr. Virgil L. Sharpton

After receiving his PhD in Geological Sciences from Brown University (1984) as the William F. Marlar Fellow, Dr. Sharpton was post-doctoral fellow at the Geological Survey of Canada's Earth Physics Branch. In 1986 he joined the research staff at the Lunar and Planetary Institute in Houston. His research interests center on meteorite impact and its geological consequences. For the past 8 years he has investigated several large impact scars on Earth including the Chicxulub crater in Yucatan, and has published extensively on this and other craters. Dr. Sharpton received distinguished performance awards from the Government of Canada and the National Aeronautics and Space Administration. He served as Guest Investigator on the NASA Magellan Mission to Venus, Editor of the Proceedings of Lunar and Planetary Science, and as a member of NASA's Lunar and Planetary Geoscience Review Panel. He served as Co-Investigator on the recent project of reflection seismic profiling over the offshore portion of the Chicxulub crater. He is currently the Chairman of the IUGG/IUGS Global Impact Studies Program, and leads an international team interested in deep drill sampling of the Chicxulub crater. Dr. Sharpton has authored over 60 research papers on impact cratering and he currently holds four research awards to study impact structures on Earth and the Earth-like planets.



## Highlights of the Forthcoming 1998 Offshore Technology Conference

May 4 - 7, 1998 in Houston, Texas

### **Technology Integration for Reservoir Characterization and Monitoring (May 4, 9:30 - 4:00)**

The characterization of reservoir heterogeneities that control fluid flow demands high vertical resolution and dense areal coverage of data. As a result, accurate reservoir models require the integration of data from a broad variety of disciplines and over a range of different length scales - from core analyses through well logs, production tests, borehole seismic, and 3-D seismic. This session focuses on the integration of seismic data with well and production data to better characterize the static (lithology, porosity, and permeability) and dynamic (fluid saturation, pressure, and temperature) properties of reservoirs. Seismic attributes, inversion, 3-D visualization, and time-lapse comparisons are explored as tools for improved reservoir models.

### **3D Seismic Survey Optimization (May 5, 9:30 -4:00)**

In seismic surveys, as in engineering, we wish to minimize cost for a sufficient solution. Papers presented in the morning session will point the way towards less expensive 3D surveys that achieve the desired goals of high resolution and high signal-to-noise. The afternoon keynote paper will discuss imaging with converted waves, a seismic technology made possible by advances in ocean-bottom recording. Other afternoon speakers will describe novel solutions to marine 3D challenges, such as more rapid turn-around of processed 3-D seismic volumes.

### **Lessons Learned and the Road Ahead in Depth Imaging (May 6, 9:30 - 4:00)**

Routine depth imaging is one of the "next frontiers" in geophysics. Although costly and time consuming, some companies recognize its value and are investing in its use even at the current costs. Oil companies and contractors are rapidly developing new algorithms and procedures for its optimization and cost reduction. This session will discuss the value of depth imaging, what we have learned about its limitations, and the road ahead.

### **International Offshore Field Studies: Asia, Aral, Peru and Angola (May 6, 1:30 - 4:00)**

Exploration and development of hydrocarbon resources from a wide range of basins around the world have both similarities and differences from which valuable lessons may be learned.

### **International Offshore Field Studies: Brazil (May 7, 9:30 - 12:00)**

Petrobras' experience with the development of ultra-deep giant fields of Albacora, Roncador and Barracuda has taught many valuable lessons in reservoir management and exploitation strategies.

# MARCH 1998

SUNDAY	MONDAY	TUESDAY	WEDNESDAY	THURSDAY	FRIDAY	SATURDAY
<b>1</b>	<b>2</b>	<b>3</b>	<b>4</b>	<b>5</b> Reservoir Geophysics SIG	<b>6</b>	<b>7</b>
<b>8</b>	<b>9</b> Joint GSH/HGS Technical Dinner	<b>10</b>	<b>11</b> GSH Technical Breakfast	<b>12</b>	<b>13</b>	<b>14</b>
<b>15</b>	<b>16</b> GSH Technical Luncheon	<b>17</b>	<b>18</b> Data Processing SIG Near Surface Geophysics SIG	<b>19</b> Potential Fields SIG May newsletter copy deadline	<b>20</b>	<b>21</b>
<b>22</b>	<b>23</b>	<b>24</b>	<b>25</b>	<b>26</b>	<b>27</b>	<b>28</b>
<b>29</b>	<b>30</b>	<b>31</b>				

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