

## Institute for Exploration and Development Geosciences

### Dr. John Castagna

*Avoiding Overfitting Caused by Noise with Uniform Training Mode AND The Impulse Response of BP Neural Networks and Seismic Wavelet Extraction* (with **Z.P. Liu**), International Joint Conference of Neural Network, Washington D.C. July 1999.

*Three-Parameter AVO Crossplotting in Anisotropic Media* (with **He Chen, Raymon L. Brown & Antonio Ramos**), SEG Conference, 1999.

*Anisotropic Effects on Full and Partial Stacks* (with **He Chen**), SEG Conference, 1999.

*AVO Inversion of a Gulf of Mexico Bright Spot - A Case Study* (with **P. Nsoga Mahob & R.A. Young**), *Geophysics*, 64, 1480-1491.

*AVO and Velocity Analysis*, (with **Debashish Sarkar** and **W. Lamb**), submitted to *Geophysics* and accepted as 1999 SEG expanded abstract. **Kathy Sokolic** appears on expanded abstract.

## Rock Mechanics Institute

### Dr. Dimitrios V. Papavassiliou

*Turbulent Transfer of Heat Over a Step Change in Wall Heat Flux*, paper 107e, American Institute of Chemical Engineers Annual Conference, Dallas, November, 1999.

*Non-Darcy Fluid Flow Through Anisotropic Materials* (with **S.L. Lyons**), paper 127n, American Institute of Chemical Engineers Annual Conference, Dallas, November, 1999.

*Exploring High and Low Re flow Using High Performance Computing*, Partners in Scientific Collaboration Workshop, Oak Ridge National Laboratory, Oak Ridge, August 1999.

*Simulation of Non-Darcy Flow Through Porous Media* (with **S.L. Lyons & M.E. Henderson**), ASME Conference, Boston, August, 1999.

*Validation of Non-Darcy Well Models Using Direct Numerical Simulation* (**V.A Garanzha, V. N. Konshin, S.L. Lyons & G. Qin**), International Workshop on Computational Physics: Fluid Flow in Porous Media, Beijing, China, August, 1999.

Office of the Director  
Sarkeys Energy Center  
University of Oklahoma  
100 East Boyd Street, Suite 510  
Norman, OK 73019-0628

THE UNIVERSITY OF OKLAHOMA  
SARKEYS ENERGY CENTER  
CONNECTION

## The Link Between the Petroleum Research Community & Industry

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# THE UNIVERSITY OF OKLAHOMA SARKEYS ENERGY CENTER CONNECTION

## OU Sarkeys Energy Center To Undertake Bulgarian Feasibility Study

Agreements between Bulgargaz, the University of Oklahoma Sarkeys Energy Center's Institute for Energy Economics and Policy, Enron Corp. and the U.S. Trade Development Agency was signed in Sofia, Bulgaria on Jan. 24.

The U.S. TDA approved the Energy Center's proposal for a feasibility study on behalf of Bulgargaz, the national gas corporation of Bulgaria. The study will determine options for expanding the Chiren Underground Gas Storage facility and the establishment of a National Gas Industry Information Service for Bulgargaz. The award is valued at \$276,000 and will partner the Energy Center and Enron Corp. of Houston.

"The study will address the important need for peak gas storage in the emerging gas markets of eastern Europe and Bulgaria," said Dennis O'Brien, Institute director and project manager. "When further developments occur as the result of the study, the people of the region will benefit by increased supply and price stability."

The study will determine the need and the economics of the Chiren site for seasonal variations of gas requirements in the region. It will also account for the increase in transit of gas across Bulgaria. By anticipating the future liberalization of markets, the National Gas Information Service part of the project is expected to promote informed decision making and operational efficiency for Bulgargaz.

"The study will involve five of Sarkeys Energy Center's institutes as well as other centers of excellence at

the University of Oklahoma, the state of Oklahoma and the Southwest region," added O'Brien. "The economic implications for OU and Oklahoma are significant. The recommendations create a positive impact on Oklahoma's energy service industry and investment community due to the partnership with Bulgaria."

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the partnership with  
Bulgaria.**

**Dennis O'Brien  
Director, Institute for Energy  
Economics and Policy**

The study will last approximately six months. In addition to the Institute of Energy Economics and Policy, work on the study will also include U.S. and Bulgarian subcontractors and four other Energy Center institutes: Rock Mechanics, the Institute for Reservoir Characterization, the Institute for Exploration and Development Geosciences, and the

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SPRING 2000

**Dr. W. Darrell "Gus" Gertsch**

Director,  
Sarkeys Energy Center and  
Vice Provost for Energy Research  
and Development Programs

**Dr. Joseph M. Suflita**

Associate Director,  
Sarkeys Energy Center,  
Director, Institute for Energy and  
the Environment and  
MAPCO Professor of Environmental Quality

**Lori Hatfield Jackson**

Manager, Research Communications  
Editor, Sarkeys Energy Center Connection

Sarkeys Energy Center Director's Office  
100 East Boyd St., Suite 510  
Norman, OK 73019-0628  
phone: (405) 325-3821  
fax: (405) 325-3180  
email: ggertsch@ou.edu  
www.ou.edu/sec

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## 1999 International Energy Policy Conference Premieres Phillips New CEO

The 1999 International Energy Policy Conference, held Dec. 9-10, was considered a huge success with nearly 100 participants from 10 different countries and representatives from across the United States.

The program covered such topics as: "Recent Development in Energy Markets," "Recent Development in Energy Issues and Policy," "The Future of the Oil and Gas Industry," "Deregulation of Electricity," and "Restructuring of the Electric Power Industry in Oklahoma and the Southwest."

Keynote speaker was Jim Mulva, chairman and CEO of Phillips Petroleum, who made his first public speaking engagement since taking the top spot at Phillips. He stressed that Phillips' short-term plan is to focus primarily on its higher return exploration and production business while allowing downstream businesses to grow through joint ventures.

"We are looking for 50-50 partnerships that will make these businesses part of larger, more efficient, self-funded enterprises," said Mulva.

He announced the first of one of several joint ventures Phillips has planned in the near future. The joint venture is with GPM, a gas gathering, processing and marketing business with operations in Texas, Oklahoma and New Mexico. GPM owns, operates or has interest in 16 processing plants and 29,000 miles of gathering lines. For the first nine months of 1999, GPM had net income of \$63 million. "This is a very good business and the best at what it does, but it too needs substantial financial resources in order to grow," he said.

The second joint venture will be in chemicals and the third will be a partner in refining, marketing and transportation business. "We want to find a partner that complements our strengths, that also has high-quality assets and that shares our commitment to growth," said Mulva. "We want to hold a significant interest in several very large, key chemical centers."

He emphasized that Phillips is not exiting its downstream business. "We must reposition them into new corporate structures if they are to grow

and compete," explained Mulva. "Integration gives us a competitive edge as we do deals around the world. They want partners who not only can help them develop their petroleum resources, but also upgrade and market them. There are few companies that can match our expertise in natural gas, chemicals and in refining technology."

Over the next five years, Phillips plans to double reserves and increase production 60 percent. Crude oil production for the first nine months of 1999 totaled 229,000 barrels daily. Natural gas production for the first nine months of the year totaled 1.4 billion cubic feet daily.

A panel of Denise Bode, Oklahoma corporation commissioner, Dewey Bartlett, president of the Oklahoma Independent Petroleum Association, Michelle Foss, University of Houston energy authority, and moderated by former Oklahoma Corporation Commissioner Cody Graves, discussed developments in energy markets.

*(continued on page five)*



*(l to r) Dennis O'Brien, director of the Institute for Energy Economics and Policy, with Jim Mulva, CEO Phillips Petroleum.*

## Project-Based Class Links High School, College Students

*Lori Whitaker, The Oklahoma Daily*

Mark Nanny, Institute for Energy and the Environment and assistant professor of environmental chemistry in the College of Engineering, wanted to create a project-based class that would transition the barrier between high school and college. The result was E3.

E3 is the acronym for Enhanced Environmental Education, a program design to integrate OU engineering faculty and students with high school students. Students in the program conduct experiments and research at the closed Norman landfill on the bank of the South Canadian River. The program is in its second year.

Three Oklahoma City high schools are involved: Southeast, Northeast and Capitol Hill. The students have regular classes at their high schools, but they go to the landfill once every nine weeks. Nanny and OU engineering students help class participants gather samples and information.

***You don't experience quicksand until you stand there and sink. This is not an experience you get at a park.***

**Ruthie Jones, junior  
Southeast High School, Oklahoma City**

The experiments range from testing water pH levels to digging seep from the bottom of the landfill. "You don't experience quicksand until you stand there and sink," said Ruthie Jones, a Southeast high school junior. "That is not an experience you get at a park."

Landfill experiments are not all that the students test. Jones said students tested Southeast's courtyard to find out how acidic the large February snowfall was. The results showed that the snow contained a large amount of acid.

In addition to the landfill research, Nanny surveyed the students to find out how effective the program is for students. Sixty percent said the class improved their learning curve in science.

Chris Brewster, assistant principal at Deer Creek High School, went to a conference where he saw a presentation about the program. He feels the class legitimizes science and provides a hands-on setting where students can learn about the environment.

The project-based class is funded through the National Science Foundation, the U.S. Environmental Protection Agency and OU. ■

## Economist Lays Oil Fluctuations at East Asia's Feet

The Institute of Energy Economics and Policy hosted Hoesung Lee, president of the International Association for Energy Economics, on the Norman campus on Nov. 12, 1999. The title of his presentation was "The Economic Crisis in Asia and World Energy Demand."

Lee explained how East Asia's economic conditions not only contributed to last year's drop in the price of oil but to this year's resurgence as well. "A weakening of oil demand in East Asia as a result of economic crisis there was a major contributor to last year's sharp drop in oil prices," he said.

That decrease was felt especially hard in Oklahoma, where the state's benchmark of crude oil fell from \$16 per barrel at the start of 1998 to a year-end price of about \$8, the lowest value on an inflation-adjusted basis since the 1930s.

Lee contributes the rise in world oil prices in 1999 partly to an agreement by several oil-producing nations, including key members of OPEC, to trim production starting in April 1999.

East Asia's economy also has improved dramatically since the crisis of 1997 and early 1998. The turnaround is "quite remarkable considering how deep a pessimism we had two years ago when the crisis first broke out," said Lee, who also serves on the Council on Energy and the Environment in Seoul, South Korea, and on the board of directors of Hyundai Corp.

East Asia's economic improvement has led again to stronger energy demand growth in the region, which includes Korea, Japan, China, Taiwan, Singapore, Indonesia, Malaysia, Thailand, and the Philippines.

"I already think the (energy) demand increase in the oil sector in East Asia has helped greatly for OPEC to maintain their cohesiveness without too much worrying about who should cut their production to maintain the high oil prices," said Lee.

Before the crisis, nine East Asian countries collectively accounted for 21 percent of world energy consumption, with oil being the dominant fuel in all those countries, except China where coal is the main source, he said.

"Therefore, when the fundamentals of economic strength broke (in East Asia in 1997), it was inevitable that the major impact would show in the energy sector," said Lee. ■

### Upcoming Events

May 2000, Board of Directors Meeting  
July 2000, KECK Laboratory Dedication  
Sept. 30, 2000, EIA Conference  
Nov. 30-Dec. 1, 2000, International Energy Policy Conference



Dr. Younane Abousleiman

## Abousleiman Named Director of Rock Mechanics Institute

The Energy Center is pleased to announce the appointment of Dr. Younane Abousleiman as the director of the Rock Mechanics Institute.

Abousleiman joined the University of Oklahoma faculty in 1991 after earning his doctoral degree from the University of Delaware. His master's degree is from Columbia University and his undergraduate degree is from the American University of Beirut, Lebanon.

"Since his first association with the Institute several years ago, Dr. Abousleiman has been crucial to our growth," said Gus Gertsch, Energy Center director. "He is a consummate team player, a natural leader and an excellent scientist. He enjoys enormous respect from his peer and several industry sponsors of the Institute's programs. We are fortunate to have him as a vital part of our management team."

He was selected as one of the *2000 Outstanding Scientists of the 20th Century* by The International Biographical Center in Cambridge, England. In addition to being listed in *Who's Who in America* and *Who's Who in the World*, he received the International Association for Computer Methods and Advances in Geomechanics' Award for the Most Significant Paper in Fundamental Research.

Abousleiman served as the Rock Mechanics Institute's executive associate director since 1998. In addition to his time at OU, Dr.

Abousleiman has served on the faculty of The Lebanese American University in Byblos, Lebanon and the University of Delaware. He has about 100 academic publications.

He was fundamental in soliciting nearly \$5 million in grants for the Rock Mechanics Institute and is the principal investigator for industry sponsored funding, which focuses on such research areas as reservoir compaction and subsidence, inclined boreholes, simulation of naturally fractured reservoirs, acoustic emissions in rocks, poroelastic media and sanding.

Abousleiman served as the session chairman for the 1999 IUTAM Symposium on Theoretical and Numerical Methods in Continuum Mechanics of Porous Materials in Stuttgart, Germany and the 37th U.S. Symposium on Rock Mechanics in Vail, Colorado. Dr. Abousleiman was the Conference Chairman for the 1998 Biot's Conference on Poromechanics in Louvain-la-Neuve, Belgium and the Third and Fourth International Conferences on Computer Methods and Water Resources in Byblos, Lebanon.

His professional memberships include the American Society of Civil Engineers, the International Association of Boundary Element Methods, Society of Petroleum Engineers, International Society of Rock Mechanics and the American Rock Mechanics Association. ■

*He is a consummate team player, a natural leader and an excellent scientist.*

Gus Gertsch,  
Director, Energy Center

## Bulgargaz Feasibility Study (continued from page one)

Institute for Gas Utilization Technologies.

Enron will provide key expertise in systems engineering and advice on optimal project implementation options. The Enron team of experts is headed by John Oliver, Enron's general manager for ground gas storage and national gas industry information service.

"We are pleased to partner with a prestigious company like Enron on this important study, which has so many interesting technical and political dimensions for the energy security of eastern Europe," said Gus Gertsch, OU

Energy Center director. "We are also gratified by the increasing international recognition of Sarkeys Energy Center and our capability to undertake complex energy research projects anywhere in the world."

Based on the results of the study, the follow-up project implementing the study's findings will lead to significant improvement of the management and operational efficiency of the gas pipeline system in Bulgaria. In addition, it will promote foreign investment, national and regional energy security and the develop-

ment of emerging free markets in Bulgaria and the region.

The grant underscores the desire of the U.S. TDA to promote efficient growth of the energy sector in Bulgaria and the Balkans and create greater awareness of emerging business opportunities.

"The award of this grant is evidence of the growing importance of the Balkan gas markets and the leading role of Bulgargaz," said Boyko Nitzov, IEEP's associate director and team leader of the project. ■

## OU Energy Center Named OCITA Export Advocate of the Year

The Oklahoma City International Trade Association has named the University of Oklahoma's Sarkeys Energy Center as the Export Advocate of the Year from the academic community. The award was presented by Lt. Gov. Mary Fallin to Gus Gertsch, director of the Energy Center, who accepted the award during ceremonies held on Jan. 25, at the Petroleum Club in Oklahoma City.

"I've often mentioned the strong international presence of the Energy Center, especially in the global oil and gas industry," said Gertsch. "This award recognizes the reciprocal benefits which derive from that international presence to the state of Oklahoma and to OU."

The OCITA is a long-standing professional trade association that plays an active role in encouraging international trade in the business community and throughout the state of Oklahoma. The purpose of the award is to recognize companies and organizations who play a pivotal supporting role in allowing others to participate in the international arena. "These awards were established in order to recognize companies and organizations who have exhibited outstanding commitment to their international activities," explained Linda



Director Gus Gertsch accepts the OCITA Award on behalf of the faculty and OU Energy Center's faculty and staff from (left) Oklahoma Lt. Gov. Mary Fallin and Linda Allen, OCITA vice president.

Richardson, OCITA executive director.

Sarkeys Energy Center was recognized due to its involvement in research relationships in over 17 different countries around the world. Its most recent contributions include: the Kazakhstan Feasibility Study, Bulgargaz Feasibility Study, the Vanco Ivory Coast Scholarship Program, PetroVietnam Scholarship Program, the 1999 International Energy Policy Conference and serving as hosts to visiting energy scholars from China, Turkmenistan, Uzbekistan, Kyrgyz Republic and Iran.

In addition to the OU Energy Center, the OCITA also recognized the Oklahoma State Chamber of Commerce and KIMRAY during the award ceremony. ■

## Interdisciplinary Grant Awarded for Research on Microbial Influences on Oil Field Scale and Pipe Corrosion

The University of Oklahoma has given its approval of a \$19,000 interdisciplinary research grant submitted by Lee Krumholz, Institute for Energy and the Environment and assistant professor of botany and microbiology, and Thomas Dewers, assistant professor of geology.

The project will explore the influence of microorganisms on the formation of pipe scale and pipe corrosion. "Among the problems encountered in the production of oil and natural gas, some of the most difficult and expensive to alleviate include scale-up and pipe corrosion," explained Dewers. "The project will explore the influence of microorganisms

on the formation of pipe scale and pipe corrosion. Approaches to alleviate these problems have been limited to attempts based solely on the physical geochemistry, but there is abundant and growing evidence for the involvement of microorganisms in the bore hole processes."

Krumholz and Dewers' hypothesis is that pipe corrosion and scale formation is amplified by the action of anaerobic bacteria on substrates present in produced water and adjacent steel pipes. Research is being conducted to test this hypotheses in a series of controlled laboratory experiments. In addition, in situ experiments will be conducted in an

anoxic spring in Kiowa County, Oklahoma, which is thought to be an expelled Anadarko Basin oil field brine.

"The problems associated with oil field scale are undeniably important to the energy industry. I am particularly pleased to see the blending of talents between these two scholars," added Joseph Suflita, director of the Institute for Energy and the Environment and associate director of the Energy Center. "This collaboration represents yet another way for the Energy Center and the academic departments to cooperate on topics of benefit to OU students, the petrochemical industry, and the community at large." ■



John W. Elias

## OU Sarkeys Energy Center Announces New Board Members

The University of Oklahoma Sarkeys Energy Center is pleased to announce the appointment of Steven E. Moore, OG&E Energy Corp., and John W. Elias, Edge Petroleum Corp., to its distinguished Board of Directors.

Moore is currently chairman of the board, president and chief executive officer of OG&E, a company with \$1.4 billion in annual revenues and headquarters in Oklahoma City.

He received his business degree in 1968 and a juris doctorate in 1971 from the University of Oklahoma. He also served as an officer in the U.S. Army Reserve from 1968 to 1974.

Prior to joining OG&E in 1974, Moore was an assistant attorney general for the State of Oklahoma. He was elected vice president of Law and Public Affairs in 1986, senior vice president of Law and Public Affairs in 1994, and OG&E president and chief operating officer in 1995. In May 1996, he

was named chairman of the board, president and chief executive officer.

In addition to his duties at OG&E, Moore plays an active role in community and industry organizations. He is past chairman for the Oklahoma City Chamber of Commerce and serves on the Chamber's Board and Executive Committee. He is chairman of the Oklahoma State Chamber of Commerce and serves on the boards of the Oklahoma City Public Schools, Allied Arts, United Way of Greater Oklahoma City, Omniplex and the Oklahoma City Arts Museum, among others. He is a member of the Board of Trustees of the OU Foundation and Oklahoma City University. He is also on the Board of Directors of the Edison Electric Institute. Moore resides in Oklahoma City with his wife, Nancy, and their children, Lisa and Scott.

Elias is currently chairman,

president and chief executive officer of Edge Petroleum Corp.

He is a 1958 graduate of Kinkaid and attended the University of Oklahoma and Harvard University's Advanced Management Program.

Prior to joining Edge Petroleum, Elias worked with Amoco Production Co. and its parent, Amoco Corp. for 30 years in a variety of operational and senior management positions. He served as a director and executive vice president for Seagull Energy Corp. from 1993 to 1997.

He serves on the Board of Directors for the Houston Grand Opera and the Kinkaid Alumni Association. Elias has served on the advisory board for Dedman College at Southern Methodist University and ESRI at the University of South Carolina.

Elias resides in the Houston area with his wife, Judy. They have two daughters, Susan and Maria. ■



Steven E. Moore



## Gertsch First Speaker For The Oklahoma City-Edmond Chapter of the International Energy Advocates

Dr. Gus Gertsch, (second from left), is pictured with Mac Alloway, chairman of the International Energy Advocates, Mark Stansberry, executive director of Oklahoma City-Edmond Chapter, and Dean Sims IEA executive director. The statue is a replica of the Oil Patch Warrior from the historic oil field of World War II in Nottinghamshire, England.

## DeGoyler Presidential Fellowship Awarded To Geophysics Student

(Pictured from left to right) Dr. John Castagna, Institute for Exploration and Development Geosciences director, fellowship recipient and geophysics graduate student Lindsay Poth, OU Provost Nancy Mergler and Dr. Joseph Suflita, Sarkeys Energy Center associate director and director of the Institute for Energy and the Environment.



Each panelist agreed the petroleum industry is enjoying much higher oil prices than a year ago, but stressed caution concerning new spending and were wary of economic and technological changes that may affect oil demand and prices.

Bode, also past president of the Independent Petroleum Association of America, said although prices are much better for many in the oil industry, "the crisis is not over." Investment in new drilling activity has been relatively slow to increase again, she said, partly because of uncertainty about where the prices are headed.

**Competition will drive the prices lower. We need more creative energy on how to build strong electric companies and build the economy.**

**Mike Davis, OG&E on the deregulation of electricity**

Foss expressed concern for the rise in the "dot-com generation" and how it may be affecting energy demand now. "Internet businesses are very demanding in terms of energy requirements," explained Foss. "We think that a lot of what you see in accelerated demand for electricity in the United States and elsewhere is because of e-commerce and the demands of an Internet environment."

Discussion at the Sarkeys Energy Center on the second day of the conference focused on the restructuring of the electric power industry in Oklahoma and the Southwest. State legislation was passed in Oklahoma in April 1997, that called for retail competition in the power industry by July 2002. Utility officials shared their perspectives about what deregulation will mean to the industry and its customers during the session.

"Electric deregulation is going to be a 20-year transition," said Ken Malloy, president of the Center for the Advancement of Energy Markets. "With the impact of deregulation, today's 4,000 utility companies in the U.S. will be



(l to r) Panelists Ed Blessing of Caspian Energy, Oklahoma Corporation Commissioner Denise Bode, Michelle Foss and moderator Cody Graves, former Oklahoma Corporation commissioner.

reduced to 500 in 10 to 15 years. There is a surplus of energy, but a shortage of intellectual capital to increase the efficiency of electric power production and reduce the environmental impact of power plants," he said.

Mike Davis of OG&E, Oklahoma's largest electric utility, stated it's about customer choice. "We've supported it (deregulation) all along," he said. "If we don't do this well, politicians and utilities will close. Customers vote."

Davis also said reductions in the price of electricity in Oklahoma will be unlikely until several years after deregulation occurs because the industry is in a rebuilding phase. "Competition will

drive the prices lower," said Davis. "We need more creative energy on how to build strong electric companies and build the economy. It hasn't happened yet."

Conference sponsors include the State Chamber of Oklahoma's Association of Business and Industry, Greater Oklahoma City Chamber of Commerce, Oklahoma Department of Commerce, American Academy for Distance Education, The Global Trade and Development Corporation, Sarkeys Energy Center's Institute for Energy Economics and Policy and the Oklahoma Royalty Company. ■  
Information derived from articles by Bob Vandewater (formerly, The Daily Oklahoman) and David Page (The Journal Record).

## Mulva's Comments On The Energy Center

"Phillips has worked with the (OU) Sarkeys Energy Center since its inception almost ten years ago, so I was pleased when Dr. Dennis O'Brien and Mark Stansberry asked me to speak today.

We are involved with Sarkeys (Energy Center) on a number of initiatives and have been fortunate to hire some of its top graduate students. We have also sent about 200 of our employees through the Center's course on reservoir characterization.

This is an excellent program and a very important one. The more we can learn about hydrocarbon reservoirs, the more oil and gas we can recover and the more effective use we can make of our capital.

We also appreciate the many forums that the Center helps sponsor—forums like this one that bring together different voices, different perspectives and different approaches to the issues facing our industry."