

IOR2012 NEWS

EIGHTEENTH SPE IMPROVED OIL RECOVERY SYMPOSIUM

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Improved Oil Recovery
Issues and Options in an Uncertain World



SYMPOSIUM TO HONOR FOUR 'IOR PIONEERS'

An esteemed group of petroleum scientists devoted to advancing knowledge and technology to improve and enhance oil and gas recovery will command the spotlight at the midpoint of the 18th Improved Oil Recovery Symposium, scheduled for April 14–18, 2012, in Tulsa, Okla.

The 2012 IOR Symposium will honor four distinguished “IOR Pioneers” at a special recognition luncheon on April 17, 2012, at the Renaissance Hotel and Convention Center in Tulsa. They are Chun Huh, Brij Maini, Malcolm Pitts, and Bill Rossen.

The five honorees will be recognized at IOR 2012 for their significant contributions to the fields of improved oil recovery and enhanced oil recovery.

“The award recognizes and expresses special appreciation to individuals who have pioneered and made significant advancement in the technology for improving oil recovery,” said Dwight Dauben, chairman of the Pioneer Awards committee, part of the symposium’s planning committee that organizes the biennial event under the auspices of the Mid-Continent Section of the Society of Petroleum Engineers (SPE).

“Over the past 28 years, 62 individuals have been recognized as IOR pioneers,” he added.

To see the list of past IOR Pioneer honorees, visit the IOR 2010 website page at www.speior.org/pioneer.asp.

AWARD'S SIGNIFICANCE

Dauben, a Tulsa-based petroleum consultant and a 2002 IOR Pioneer honoree, outlined the kind of contributions to the oil and gas industry typical of an IOR pioneer:



DAUBEN

“The IOR Pioneer Award recipients typically devote two to four decades of their careers to the development and application of leading-edge technology designed to increase recovery from the older oil fields. They typically endure many trials, tribulations, hardships, failures as well as successes.”

*Dwight Dauben, Chairman,
IOR Pioneer Committee*

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“As a result of their many years of effort, the IOR Pioneers make significant improvements in the technology and/or economics of the existing processes and may even develop totally new processes for improving oil recovery. The research and development process is often slow and tedious, but the payout is significant.”

The IOR Pioneers also serve as role models and mentors for young professionals and students, Dauben added. “Most of the recipients are humble about their achievements and think that others are more deserving. They are usually surprised about their selection and are quick to recognize the efforts of others who have helped them in their career. They are driven by a passion to improve the existing technologies with little desire for self-promotion. These characteristics are regarded favorably by the younger professionals who are just beginning their careers. “

CHUN HUH

Dr. Chun Huh is one of the world’s leading experts on surfactant/polymer flooding and nanoparticles for upstream research, according to Huh’s IOR Pioneer Award nomination letter.

A research professor at University of Texas at Austin over the past seven years, Huh joined UT after working at ExxonMobil Upstream Research Company for 27 years. He retired from ExxonMobil as a research advisor.

Prior to ExxonMobil, Huh worked at the Pulp & Paper Research Institute at Montreal, Canada, for 5 years. He has a PhD from the University of Minnesota and a BS from Seoul National University, both in chemical engineering.

Most surfactant EOR researchers are familiar with the “Chun Huh equation” which estimates interfacial tension (IFT) from phase behavior. This equation is very accurate and has virtually eliminated direct measurement of IFT by a spinning drop tensiometer. Huh also played a key role in the development and implementation of various process model features in Exxon reservoir simulators for surfactant flood processes, polymer flood processes, gas-flood processes, and miscible/foam processes.

He developed improved characterization of non-Newtonian rheology and retention of aqueous solutions of polymer flowing in porous media and for thermal decomposition of polymer in porous media. He participated in the design and execution of three single-pattern and two multiple-pattern micellar/polymer flood field pilot tests while at Exxon. He led a team to interpret/evaluate the results of the series of field tests.

At UT Austin, Huh has started research on application of nanoparticles for upstream research. He also is developing methods to determine oil saturation in reservoir rocks using paramagnetic nanoparticles and magnetic field and is working on the use of nanoparticles for EOR mobility control.

In addition to mentoring many graduate students and teaching many classes, Huh has about 60 publications and 7 patents from his research.

Prof. Huh has been an active member of the Society of Petroleum Engineers. He has chaired many SPE ATCE and IOR sessions and served as the Chairman of the SPE Reservoir Engineering Editorial Review Committee.

BRIJ MAINI

Dr. Brij Maini was described in his nomination letter as a “true pioneer” in the development of IOR processes for heavy oils and bitumen.



HUH



MAINI

Maini has been a professor in the Department of Chemical and Petroleum Engineering at the University of Calgary in Calgary, Alberta, since 1999. Prior to that, he was a research engineer with the Petroleum Recovery Institute (PRI) in Calgary from 1979 to 1999. Beginning in 1994, Maini also was an adjunct professor at the universities of Calgary, Alberta, and Regina. During 1976–1979, he worked as a research associate in the University of Calgary’s Department of Chemical and Petroleum Engineering.

Dr. Maini has a degree in chemical engineering from the Indian Institute of Technology and a PhD in chemical engineering from the University of Washington (Seattle).

Maini’s work is often referenced in journal papers and conference proceedings in the areas of thermal and non-thermal recovery techniques. The elevated temperature and pressure two- and three-phase relativity curves he generated at PRI are still widely used in contemporary reservoir simulators.

According to his University of Calgary engineering department colleague (and IOR Pioneer honoree in 2010), Prof. R. Gordon R. Moore, in the mid-1980s, “Maini and his group at PRI were the first to recognize the importance of ‘foamy oil’ flow in reservoirs, and this is now recognized as an important mechanism in the cold production of heavy oil with sand.”

Dr. Maini’s work currently focuses thermal and non-thermal oil and hydrate recovery processes, including continued work on the flow of foamy oils in porous media. Other areas of research emphasis include propagation of nano-catalysts through porous media and development of models related to the VAPEX and SAGD processes.

He teaches undergraduate courses in waterflooding and graduate courses in secondary and tertiary recovery and has published more than 160 papers and over 100 PRI technical reports, and he owns two patents.

Maini is a member of SPE and the Association of Professional Engineers, Geologists and Geophysicists of Alberta.

MALCOLM PITTS

Dr. Malcolm Pitts has been actively developing, promoting, and applying alkaline-surfactant-polymer (ASP) floods for 30 years.

He has been the key person driving application of ASP technology for most of that period, according to Pitts’s nomination letter.

Pitts also received a special honor at the 2008 IOR Symposium in Tulsa, when he was bestowed with Oil Chem’s first award for outstanding contribution to chemical EOR. (Oil Chem Technologies, based in Sugar Land, Tex., supplies surfactants for chemical EOR.)

Oil Chem described the award as one “given to the individual who has been directly involved in the development of the chemical or process under consideration, and the chemical or process must have been implemented successfully in the field during the past 3 years preceding the [IOR Symposium] when the award is presented.”

The awardee was chosen by a committee of peers.

Pitts is president of Surtek Inc., a Golden, Colo.-based technology developer that conceived the ASP EOR process. The company works as consulting firm specializing in all phases of chemical flood design.

Pitts joined Surtek in 1980. During his tenure at Surtek, he has designed micellar-polymer, mobility control polymer, alkaline-polymer, and ASP floods for 28 field projects. Pitts holds a BS in chemistry from the University of Colorado, an MS in chemistry from Purdue University, and a PhD in chemistry from Georgetown University. He served on the SPE Board of Directors from 1995 to 1998 and was named a Distinguished Member in 2000. He is a Certified Professional Chemist and a Fellow of the American Institute of Chemists. He is a technical editor for SPE Reservoir Evaluation and Engineering and the Journal of Petroleum Science and Engineering.



BILL ROSSEN

Dr. William Rossen has been at the forefront of development of foam technology for IOR applications for most of the past 30 years.

Rossen is the chair (since 2007) and a professor of reservoir engineering with the Faculty of Civil Engineering and Geosciences, Department of Geotechnology, Delft University of Technology, Delft, The Netherlands.

Prior to that, he served with the faculty at the University of Texas at Austin, Department of Petroleum and Geosystems Engineering, from 1989 to 2006, where he was department chair during 2005–2006.

Rossen worked for Chevron Oil Field Research Co., in La Habra, Calif., during 1982–1989, where he led research on the design of surfactant formulations and foams for EOR. He has a degree in chemical engineering from the Massachusetts Institute of Technology and a PhD in chemical engineering from the University of Minnesota.



Prof. Rossen's current research concerns the use of foams for diverting fluid flow in porous media, modeling complex transport processes in networks, and understanding flow in naturally fractured geological formations. Earlier research included the behavior of fluid mixtures in a centrifugal or gravitational field and the thermodynamics of mixtures of oil, water, and surface-active agents.

Rossen's current research work centers on applications of foams in petroleum engineering to direct the flow of injected fluids to desired geological formations. Foams are used worldwide in well-stimulation treatments to direct injected acid into layers most damaged by drilling and production processes.

Foams are also used to redirect the flow of gas in EOR processes, which account for about 8% of worldwide oil production but typically are limited by poor sweep efficiency.

Prof. Rossen's research has ranged from fundamental studies of the origin of foam properties in rock to modeling of field-scale foam applications. Recently, his research group has developed a simplified mechanistic foam model that makes feasible the simulation and prediction of foam process performance in the field.

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NEW FOCUS ON UNCONVENTIONAL PLAYS HIGHLIGHTS IOR 2012 SHORT COURSES

A new focus on the hot unconventional plays that have transformed the oil and gas industry highlights the line-up of short courses at the 18th Improved Oil Recovery Symposium.

Two new courses and two repeat courses have a direct bearing on the science and technology of maximizing recovery and efficiency in unconventional oil and gas development. The two new short courses are centered on unconventional gas, which ExxonMobil expects to account for 30% of worldwide gas production by 2040. In addition, two repeat courses involve technology advances in horizontal drilling and completion—key to the explosive growth of unconventional plays.

Other short courses focus on CO₂ flooding with sequestration, polymer floods, heavy oil recovery, reservoir characterization, case studies, and EOR fundamentals.

Sponsored by the Society of Petroleum Engineers' Mid-Continent Section, IOR 2012 will be held at the Renaissance Hotel in Tulsa, Okla., on April 14–18, 2012. The theme of IOR 2012 is “Issues and options in an uncertain world.”

Some of the biggest names in EOR and IOR will provide instruction for 10 one-day short courses held during the weekend of April 14-15, before the main symposium program gets under way.

Among those instructors who are leaders in their fields are Dr. Larry W. Lake, who also was Technical Program Chair for IOR 2010; Sada Joshi, one of the world's leading experts in horizontal wells; Betty Felber, owner of six patents on water-flood sweep improvement technology; and Randy Seright, one of the top names in the field of water shutoff.

CONTINUING EDUCATION ADVANTAGES

IOR 2012 short courses are an ideal opportunity for industry professionals to keep abreast of the latest developments in technology and know-how in the oil and gas upstream industry, as well as gain valuable face time networking with experts and others with like interests.

That makes them especially valuable not only to young petroleum professionals seeking to enhance their career prospects but also to older professionals transitioning to a less-structured work environment such as consulting.

In addition, the SPE courses are a “real bargain” compared to many commercial courses, according to David R. Zornes, Chair of the Continuing Education Committee and an IOR Pioneer honoree in 2010.

Zornes also pointed out that the short courses are being offered with the option of obtaining Continuing Education credits, such that registered engineers can officially fulfill their needed credits.



ZORNES

IOR short courses are offered as one-day courses at the Renaissance Hotel for \$650 for SPE members (\$700 for non-SPE members). For further information, contact David Zornes at David.R.Zornes@GMAIL.com.

FOCUS ON UNCONVENTIONAL: SHALE GAS COMPLETIONS

George King will lead a short course on “Shale Gas Completions, Fracturing, and Production” on Saturday, April 14, 2012. The course is suited for all well completion and production engineers, managers, and geologists working with shale gas reservoirs.

The course acquaints participants with the latest well completion, fracturing, and production technologies for shale gas and wet gas reservoirs. The interactive format includes field data and interpretations. The course presents an overview of technologies, such as multi-stage fracturing in horizontal wells, and a summary of field data from various shale gas plays. Technology innovations and adaptations have pushed the completions in the gas shales from 1% recovery to over 40% recovery in the past 15 years; meanwhile, the oil and wet gas shale completions are just beginning to crack the 5% recovery level. This

course will be focused on innovations in technologies that have moved oil recovery towards levels of 10% and higher by the use of improved perforating cluster design, 40+ stage stimulations, hybrid frac fluids, and enhanced stimulations with CO₂ and microemulsions that can drive interfacial tension below one.

George King is a registered professional engineer with 39 years of oil field experience. He worked for Amoco Production Co. from 1971 to 1999 and BP from 1999 to 2008. He is now with Apache Corp., where he assists on shale stimulations, production chemistry, and workovers. King has written more than 60 technical papers and a book on completions and workovers. He was a 1985 SPE Distinguished Lecturer, and 1999 SPE Short Course Lecturer. Industry positions include Technical Chair of the 1992 SPE Annual Meeting, API subcommittee chair on perforating, Adjunct Professor at the University of Tulsa (teaching well completions and fracturing), and numerous SPE committees. King holds a BS in chemistry from Oklahoma State University, a BS in chemical engineering, and an MS in petroleum engineering from the University of Tulsa.

FOCUS ON UNCONVENTIONAL: FORECASTING PRODUCTION, ESTIMATING RESERVES

John Lee will conduct a short course on “Forecasting production and estimating reserves in unconventional gas reservoirs” on Saturday, April 14, 2012.

This course teaches the skills and understanding needed to forecast production and estimate reserves in unconventional (ultra-low permeability) gas and wet gas reservoirs. Although the course emphasizes gas shale and tight gas formations, some of the material also applies to oil reservoirs. There are various ways to forecast production and estimate the size of unconventional gas reservoirs. Attendees will learn the strengths and weaknesses of each system and how to develop reliable forecasts in this course.

Participants also will learn the basic theories that describe how fluids move through a reservoir, as well as some of the most common drilling and completion techniques for recovering them. The course will deal with methods commonly used for conventional reservoirs and will suggest modifications and alternatives for ultra-low permeability reservoirs. Examples of forecasting data from the Bakken and Eagle Ford plays will be included in the class for those working in wet gas reservoirs.

John Lee is the Cullen Distinguished University Professor of Petroleum Engineering at the University of Houston. He was previously a Regents Professor of Petroleum Engineering at Texas A&M University and the former Executive Vice-President of S.A. Holditch & Associates Inc., where he specialized in reservoir engineering for unconventional gas reservoirs. He served as an Academic Engineering Fellow with the U.S. Securities & Exchange Commission (SEC) in Washington during 2007–2008 and was a principal architect of the new SEC rules for reporting oil and gas reserves.

Before joining the faculty at Texas A&M, Dr. Lee managed Exxon’s Major Fields Study Group. He has written many papers and three SPE textbooks: *Well Testing*, *Gas Reservoir Engineering*, and *Pressure Transient Testing*. Lee is a member of the National Academy of Engineering and currently holds the L.F. Peterson Chair in petroleum engineering at Texas A&M. He is a member of the U.S. National Academy of Engineering and the Russian Academy of Natural Sciences. Dr. Lee received his BS, MS, and PhD degrees in chemical engineering from the Georgia Institute of Technology

HORIZONTAL WELLS: RESERVOIR ASPECTS

Sada Joshi will instruct a class on “Reservoir aspects of horizontal and multilateral wells,” a course he also taught at the 2010 IOR Symposium, on Sunday, April 15, 2012.

While horizontal wells are riskier and more expensive than conventional wells, the production gains may be worth it. This course teaches participants when the technology justifies the risk. It is designed for reservoir, production, drilling, and completion engineers, managers, and other personnel who are interested in learning about selecting reservoirs for horizontal wells and understanding production performance of horizontal wells.

This course includes discussion on the practical issues and reservoir parameters of horizontal well projects. The topics include formation damage, drainage areas, well spacing, well reserves, and rate calculations using steady-state and pseudo steady-state methods. The course includes several field case histories and performance analysis of horizontal wells. Topics include drilling methods and costs, well spacing and drainage areas, recovery factors and steady-state solutions, case histories of coning applications, fractured horizontal wells, and forecasting production.



JOSHI

Sada Joshi is president and CEO of Joshi Technologies International. He has more than 30 years of experience in horizontal wells and has been advisor to more than 200 field projects around the world. He has written many technical papers and the book, *Horizontal Well Technology*.

Joshi served as a Distinguished Lecturer for SPE (1995–1996) and was named as “One of the 100 Most Influential People of the Petroleum Century” by Hart Publications in 2000. In 2003, Joshi was named as a Distinguished Alumnus by his alma mater, IIT Bombay, India. He earned his PhD in mechanical engineering from Iowa State University in 1978.

HORIZONTAL WELLS: COMPLETIONS

Aaron Burton and Sid Banerjee will co-lead a short course on “Horizontal well completions” on Sunday, April 15, 2012.

Horizontal drilling, coupled with multistage hydraulic fracturing, has transformed the upstream oil and gas industry as nothing else since the introduction of 3-D seismic. According to a variety of sources, horizontal drilling now accounts for more than two-thirds of all wells drilled in the U.S.—almost all of it targeting unconventional plays.

This course develops strategies for completing horizontal wells. It covers both cased-hole and open-hole configurations, either with or without sand control. Participants will learn the applications and dynamics of horizontal wells, including drill-in fluids, hole displacement, cementing, perforating, and stimulation. They will also learn the guidelines for selecting stand-alone screens and executing horizontal gravel packs. Topics include completion options, cased-hole horizontal completions, perforating and stimulating horizontal wells, open-hole horizontal completions, drill-in fluids, zonal isolation and inflow control, and displacing the drill-in fluid.

This course is designed for drilling, completion, and reservoir engineers and for service company personnel involved with planning, drilling, completing, and operating horizontal wells.

Aaron Burton is the business development manager for Baker Hughes Unconventional Completions, a group primarily focused on the completion of shales and similar unconventional plays that require multistage hydraulic fracturing. Burton joined Baker Hughes as a field engineer trainee for completion tools after graduation with a BS in mechanical engineering from Mississippi State University in 1978. During his tenure in operations, he has held the roles of field engineer, operations coordinator, and district engineer. He has completed wells in several unconventional plays in North America, including the Bakken, Marcellus, and Lower Huron shales.

Career information was not available for Sid Banerjee at presstime.

CO₂ FLOODING, SEQUESTRATION

Because of its potentially far-reaching political ramifications related to the climate change controversy, CO₂ flooding coupled with CO₂ sequestration has become a hot-button topic within the EOR/IOR community. A short course at IOR 2012 seeks to focus on the practical aspects of CO₂ flooding, along with the potential for examining CO₂ sequestration challenges.

A tag team of leading CO₂ EOR experts—Chuck Fox, Sam Avasthi, Mike Stein, and Jay Avasthi—will conduct the course “Practical aspects of CO₂ flooding EOR and CO₂ geosequestration” on Saturday, April 14, 2012.

This popular course is based on the SPE Monograph Volume 22, “Practical Aspects of CO₂ Flooding,” and is an outgrowth of the University of Texas of the Permian Basin/SPE CO₂ Conferences, and short courses held in Midland, Texas, for the past 13 years. The instructors spend most of the time on the practical aspects of CO₂ flooding, keeping the theoretical aspects to a bare minimum. Instructors also discuss the economics of CO₂ flooding compared to waterflooding. If there is enough interest among the participants, there will also be a discussion of CO₂ geosequestration. Each attendee will receive a workbook containing copies of the instructors’ PowerPoint presentations, and solutions to the problems given in class.

This course is intended for anyone who is interested in CO₂ flooding, hydrocarbon gas flooding or CO₂ sequestration. Participants typically include petroleum reservoir and production engineers, as well as facilities engineers, managers, and government officials.

Charles E. (Chuck) Fox is vice-president of operations and technology at Kinder Morgan CO₂ in Houston, Texas. He currently manages operations of the McElmo Dome CO₂ source field and some 1,000 miles of CO₂ pipelines. He is also responsible for his company's oil and gas CO₂ EOR operations. Fox has written on the practical aspects of CO₂ flooding and has taught courses at the annual CO₂ conferences held in Midland, Texas. He is a past chairman of the program committee of the SPE/DOE 14th Symposium on Improved Oil Recovery. Fox holds an MS in petroleum engineering from Stanford University and a BS in mechanical engineering from Rice University.

Dr. S.M. (Sam) Avasthi is president of Avasthi & Associates, a worldwide petroleum consulting company headquartered in Houston. He has extensive experience in oil and gas reservoir engineering and simulation, the revitalization of mature fields, and EOR project design, as well as reservoir asset optimization and training. Avasthi is an engineering alumnus of the Indian School of Mines, Imperial College of the University of London, and Texas A&M University. He earned his PhD in petroleum engineering from Texas A&M University and was a research fellow in chemical engineering at Rice University. Before founding his own company, Avasthi held senior-level petroleum engineering and consulting positions with a major oil and gas company and an international oil and gas consulting company. He is a registered professional engineer in Texas, a senior member of SPE, and a technical editor for the SPE Reservoir Evaluation & Engineering Journal.

Dr. Michael H. (Mike) Stein is retired from BP in 2006 after 28 years of service and is now a consultant specializing in EOR and integrated asset modeling. With BP, Stein was a team leader of the Integrated Asset Modeling Group in BP's Technology Center in Houston. He also directed research on ways to apply integrated asset modeling to monitor corrosion and erosion in real time and to couple integrated asset modeling with reservoir simulation. Stein holds three U.S. patents, two in enhanced coal bed methane production and one in automatic waterflood history matching. He holds a BS in chemical engineering from the University of Missouri and an MS and a PhD in chemical engineering from Purdue University.

Dr. J. M. (Jay) Avasthi is the executive vice-president and director of geoservices at Avasthi & Associates. He has extensive experience in the oil and gas industry. He has authored or co-authored numerous technical publications, has taught several short courses, and conducted hands-on training workshops in his areas of expertise. Jay Avasthi earned degrees in applied geology and mining engineering from the Indian School of Mines and an MS degree from the University of Minnesota. He received his PhD from the University of Wisconsin-Madison. Before joining Avasthi & Associates, he held senior-level research and supervisory positions at Chevron Corp. for several years. He is a long-standing member of SPE, a technical editor for the SPE Reservoir Evaluation & Engineering journal, and has served as the SPE Los Angeles Basin section director and program chairman.

HEAVY OIL RECOVERY

Heavy oil resources in Canada in recent years have emerged as one of the world's most significant sources of hydrocarbons. But it isn't just about mining oil sands: A wide range of in-situ EOR processes are also being employed to improve recovery of heavy oil resources. Many advances have been made in in-situ recovery techniques over the past 20 years, especially in Alberta, where conventional oil production has been declining. The advancement in horizontal well drilling and the invention of the SAGD process have resulted in the commercial development of horizontal cyclic steam stimulation (CSS) and numerous SAGD projects. Emerging recovery technologies are also developing in order to reduce the capital costs, operating costs, and environmental impact.

K.C. Yeung will teach the course "In-situ recovery methods and SAGD" on Saturday, April 14, 2012.

This course will provide a general overview of current and emerging heavy oil recovery methods with emphasis on field experiences in Alberta and steam-assisted gravity drainage (SAGD). Participants will learn about the concepts, field development, reservoir performances, applicability, challenges, and issues of the various in-situ recovery methods. Commercial and emerging recovery methods covered include cold heavy oil production with sand (CHOPS), CSS, steamflood, and SAGD; steam solvent hybrid; cross-SAGD, fast SAGD, and wedge wells; and VAPEX, N-SOLV, THAI, COGD, ET-DSP, and ESEIEH processes.

The advancement in horizontal well drilling and the invention of the SAGD process have resulted in the commercial development of horizontal cyclic steam stimulation (CSS) and numerous SAGD projects. Emerging recovery technologies are also developing in order to reduce the capital costs, operating costs, and environmental impact.

Many advances have been made in in-situ recovery techniques over the past twenty years, especially in Alberta where conventional oil production has been declining. All E&P personnel, including engineers, geoscientists, technologists, and managers involved or interested in heavy oil recovery methods and field practices will benefit from this course.

K.C. Yeung is manager of Oil Sands Technology at Husky Energy Inc. in Calgary. He has worked in the heavy oil industry for over 34 years, primarily in the area of reservoir development. He has been involved in various in-situ field projects including CSS, steamflood, in-situ combustion, CHOPS, and SAGD.

Yeung was a Distinguished Lecturer (2003–2004) in the Petroleum Society of CIM Distinguished Lecturer Program. For the past few years, he has given lectures and short courses on heavy oil recovery and SAGD in Canada, China, South America, and Middle East to promote Canada's in-situ heavy oil technology. He was also a member of the evaluation committee on the SPE Reprint Series No. 61, "Heavy Oil Recovery."

POLYMER FLOODS, GELS

IOR Pioneer Randy Seright will teach the short course "Polymer flooding and gel treatments" on Saturday, April 14, 2012.



SERIGHT

This course provides a comprehensive introduction to polymer flooding (for improved sweep and mobility control in reservoirs) and to gel treatments (for water shutoff and reduction of fluid channeling through reservoirs). For polymer flooding, topics covered include rheology in porous media, injectivity issues, polymer stability (mechanical, oxidative, chemical/thermal, microbial), polymer propagation issues, polymer flood design, surveillance, and evaluation, and discussion of important field applications. For gel treatments, topics include basic properties of gelants and gels, gel placement concepts, and a strategy to attack excess water production problems. A comparison of polymer flooding versus in-depth profile modification is provided.

Randy Seright is a senior engineer and heads the Reservoir Sweep Improvement group at the Petroleum Recovery Research Center at New Mexico Tech. His career has focused on methods to improve reservoir sweep efficiency, to prevent fluid channeling through reservoirs, and to reduce excess water production during oil and gas recovery—especially using polymers and gels. Seright has been a registered professional engineer in Texas

since 1983 and has taught short courses on polymer flooding and gel treatments in 13 countries. He received the SPE/DOE IOR Pioneer Award in 2008.

FIELD CASE STUDIES

One of the best ways to glean a broad sampling of what's new and interesting in IOR is to take Betty Felber's short course roundup of case history reviews of field EOR applications.



FELBER

New this year is a section on field applications of nanoparticles and how they can help improve hydrocarbon recoveries. Other technologies highlighted include CO₂ injection, sweep improvement utilizing microbes, steamflooding, and water disposal. Applications are onshore sandstone and carbonate reservoirs from the U.S. and Nigeria.

Felber advises that not all reviewed projects were economically successful, but each has valuable technical and financial lessons learned.

Felber recently retired from the National Energy Technology Laboratories' Tulsa office, and has been involved in all stages of IOR for more than 30 years. Previously she worked at Amoco Production Research Center, where she developed reservoir sweep improvement methods for waterfloods and EOR projects. She has also worked at MAPCO/CNG

Producing, where she was in charge of the improved oil recovery group. Her responsibilities included supervision of office and field personnel for the water, steam, and polymer floods.

At Core Laboratories—Houston, Dallas, and Nigeria, she served as the director of the Reservoir Description and Exploitation group. This group included geologists, geophysicists, chemists, and engineers who conducted integrated field studies in Europe, Africa, the Middle and Far East, and North and South America. Dr. Felber has published several technical papers, is credited with 6 U.S. and 2 Canadian sweep improvement patents, has represented the U.S. Government on the 13-nation Board of the International Energy Agency's Cooperative Project on Enhanced Oil Recovery, and has taught technical courses in several countries.

THE BASICS: RESERVOIR CHARACTERIZATION

No IOR Symposium short course program would be complete without a focus on the basics of IOR and EOR. Two such courses are planned for the 18th IOR Symposium by Larry Lake, the technical program chair for the 2010 IOR Symposium.



Lake will teach a course on “Reservoir characterization: from the laboratory to the field” on Saturday, April 14, 2012, that is designed to bring attendees quickly up to speed on the characterization of oil and gas reservoirs.

This course teaches integrated reservoir characterization, from basic petrophysics through geostatistics. The emphasis is on porosity, permeability, capillary pressure, and relative permeability as they relate to flow. The course also covers the statistics of the spatial distribution of these properties and illustrates the benefits of using them. Topics include single-phase petrophysical porosity, permeability and non-Darcy effects; two-phase flow: capillary pressure, relative permeabilities, and trapped phase saturations; heterogeneity and non-uniformity; effective properties: (pseudo) porosity; and absolute permeability: capillary pressure, relative permeability, dispersivity and viscous fingering.

This course is designed for engineers with at least a bachelor's degree in petroleum or chemical engineering. All other engineers, geologists, mathematicians, and physicists with at least some experience in reservoir engineering or numerical simulation can also benefit from the course.

On Sunday, April 15, 2012, Lake will lead a short course on “Enhanced oil recovery fundamentals.”

According to Lake, every oil field eventually relies on some form of enhanced oil recovery. Some require it from the start. If your career involves oil and gas production, this is an important course for you.

This course provides an integrated overview of the basics of waterflooding and EOR, illustrating the connection of each process to a few fundamental principles. It reviews the specifics of thermal and solvent EOR by relating basic principles to the results of cases from the field. Topics include the definitions of EOR and polymer flooding, the fundamentals of displacement, phase behavior, micellar-polymer flooding, chemical methods, thermal flooding, and the basics of solvent flooding.

This course is designed for engineers with at least a bachelor's degree in petroleum or chemical engineering. All other engineers, mathematicians, and physicists with at least a bachelor's degree and some experience in reservoir engineering or numerical simulation can benefit from this course.

Larry W. Lake is a professor in the Department of Petroleum and Geosystems Engineering at the University of Texas at Austin, where he has taught since 1978 and served as department chairman from 1989 to 1997 and again from 2007 to 2009. Lake is a specialist in reservoir engineering and geochemistry. His work in quantifying the effects of geochemical interactions and flow variability for resource recovery is now widely applied by the industry. He has authored four textbooks and more than 100 technical articles and reports. He earned his BS and PhD degrees from Arizona State University and Rice University, respectively. Lake has twice been designated as an SPE Distinguished Lecturer and member of the SPE Board of Directors.

IOR 2012 General Chair.....Phil Schenewerk
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Eighteenth SPE IOR Committee Roster

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Food/Evening Receptions	Lori Watts, The University of Tulsa
Sponsorships	W.F. Lawson, The University of Tulsa
Geology Field Trip	Norm Hyne, The University of Tulsa
TU Student Support	Lori Watts, The University of Tulsa
TU Student Support Scheduling	TBD
TU Student Support Scheduling	TBD
TU Student Support Scheduling	TBD
IOR Administrative Assistant	Lori Watts, The University of Tulsa

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Vice-Chairman (Programs)	Molly Boyd, Samson
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