



SOCIETY OF PETROLEUM ENGINEERS

# SPE NEWS

COPENHAGEN SECTION

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## INNOVATIVE COMBINATIONS IN THE OIL INDUSTRY

Let me thank DONG Energy for hosting what turned out to be an extremely well attended session on January 16th. Some 83 of you showed up in Hørsholm for an exciting evening on CO<sub>2</sub>. We learned about sequestration, enhanced oil recovery, related research at DTU and pilot project considerations at South Arne. In addition to shedding some light on the impact that CO<sub>2</sub> could have on the oil industry, I also met people from the industry that I had not seen in many years.

Our next meeting is on game changing innovation in the oil industry. Leo Roodhart, Manager of Strategic Innovation at Shell, will provide examples of breakthrough sub-surface technologies and mechanisms used by Shell to increase innovation. This is a highly relevant topic, as many of us feel the pressure on the oil industry to produce more oil from more difficult circumstances. We are keenly aware that innovation is required to produce some of the remaining 60% oil that is not recovered with current technology. What it takes is of

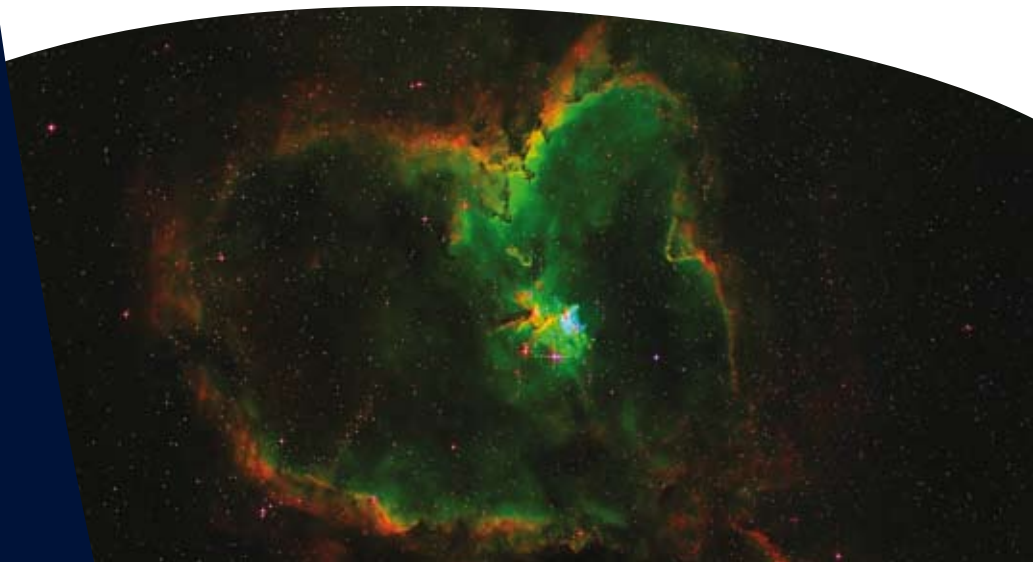
course not clear, but studies indicate, that it is not just a matter of pouring more money into research. It is not that simple. We have to free ourselves from the specialist discipline silo-thinking where we learn more and more about less and less. Instead we should be more creative and spend more time visiting the no-mans land between disciplines. The nascent discipline of cosmo-climatology where geology and astronomy are combined to provide answers on the same time scale could serve as an example. We cannot know which scientific combinations will provide innovative breakthroughs in the oil industry, but I'm inspired by the "Advanced Oil Recovery" project at DTU, where several disciplines will be combined to provide new and deeper insight into the most complex enhanced oil recovery methods. Microbial enhanced oil recovery, as studied at Aalborg University, also deserves a special mention. Read more about these projects inside the Newsletter and see who won the SPE Student Scholarship this year.

I hope to see many of you at the next SPE meeting on February 19th at Håndværkerforeningen.

**Per Bak**  
Section Chairman

## FUTURE MEETINGS

FOR MORE INFORMATION  
REGARDING THE PROGRAMME  
SEE PAGES 4-5



# SPE

COPENHAGEN SECTION

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# PETROLEUM RELATED RESEARCH AT THE DANISH UNIVERSITIES

## NEWS FROM AAUE

The students at the International Oil and Gas Master's Program in AAUE, Aalborg University Esbjerg, actively take part in the international students contests and competitions. A few months ago, 10th semester student Albert Longdon-Nyewan represented AAUE at SPE Offshore Europe Conference (Students Paper Contest) in Aberdeen. He was selected in Master's division for oral presentation with the topic "Possibilities of Microbial Enhanced Oil Recovery (MEOR) in Danish chalk oil fields".



Albert Kweku Longdon-Nyewan and 2007 SPE President Abdul-Jaleel Al-Khalifa during the programme.

The MEOR technique is studied at AAUE supported by Offshore Centre Denmark. After water injection, it is the most inexpensive tertiary recovery method. Most of the MEOR techniques involve injection and establishment of an exogenous microbial population into the oil-bearing formation. The population is supplied with nutrients and mineral salts as additives. Active components capable of releasing the oil may then be generated within the reservoir rather than being supplied externally.

## NEWS FROM DTU

### Center for Phase Equilibria and Separation Processes

A 5 year research project called ADORE – ADvanced Oil REcovery methods – has been initiated at DTU. The goal of the project is to obtain new and deeper insight into the most complex enhanced oil recovery (EOR) methods as well as advanced stimulation technology. The result will be new experimental data, new models as well as efficient and predictive methods for simulating the EOR processes. The project has five main areas: 1) Reactive Transport, 2) Phase Behavior 3) Multiphase Flow in Porous Media, 4) Rock Mechanics, and 5) Numerical Methods. The EOR processes in focus will be chemical flooding and in-situ combustion.

The ADORE project is headed by Professor Erling H. Stenby at the Department of Chemical and Biochemical Engineering (Center for Phase Equilibria and Separation Processes, IVC-SEP) and involves 7 Faculty members at this department and Department of Mechanical Engineering, Department of Informatics and Mathematical Modelling from the DTU. Furthermore GEO participates in the project as well as Stanford University and University of Southern California (USA). During the course of the project two post-doctoral researchers and six PhD students will be employed in the project. The project is sponsored by the Danish Research Council for Technology and Production Sciences, Mærsk Olie og Gas AS and DTU.

### Department of Environmental Engineering

Based on research by DTU-staff and collaborators, a review paper on chalk reservoir properties and chalk diagenesis has recently been published: Fabricius, I.L. 2007: Chalk: composition, diagenesis and physical properties. Bulletin of the Geological Society of Denmark 45, 97-128.



## STUDENT SCHOLARSHIP

The 2008 SPE student scholarship has been awarded to Aymen Abouardini.

Aymen's interest in the petroleum industry started after high school, when he worked as a roustabout on the rig Noble Byron Welliver. Aymen completed his bachelor degree as a mechanical engineer at DTU in the beginning of 2007 and proceeded to study on the Petroleum Engineering Programme at DTU aiming to graduate with a Master degree early 2009. This semester Aymen is spending in Trondheim at NTNU where he is taking courses in drilling engineering.

The SPE board hereby congratulates Aymen on his excellent academic scores and wishes him all the best in his future career.



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PHD DEFENCE BY PHILIP  
LOLDRUP FOSBØL

Subject:  
"Carbon Dioxide Corrosion:  
Modeling and Experimental  
Work Applied to Natural  
Gas Pipelines"

Time: 12 February 2008,  
13:00 – 17:00  
Place: DTU, Building 101,  
room 1

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# MEETING SCHEDULE 2007-2008

September 25		MAIN SPEAKER	AFTER DINNER
TOPIC	<b>Tractor Applications in the Oil Field</b>		Welltec: Guided tour at Welltec facilities
SPEAKER	Christian Krüger, Welltec		
LOCATION	Welltec, Gydevang 25, 3450 Allerød		
SPONSOR	Welltec		

October 22		MAIN SPEAKER	AFTER DINNER
TOPIC	<b>New and Emerging Water and Gas Shut-off Techniques</b>		
SPEAKER	Naz H. Gazi, SPE Distinguished Lecturer		
LOCATION	Håndværkerforeningen, Dronningens Tværgade 2A, 1302 Kbh. K.		
SPONSOR	Chevron		

December 6		MAIN SPEAKER	DINNER SPEAKER
TOPIC	<b>Petroleum Reserves Estimates -Where We Have Been, Where We Are and Where We Appear to be Headed</b>		Maersk Contractors : Ultra Deep Water Drilling Rigs
SPEAKER	Ronald Harrel, SPE Distinguished Lecturer		
LOCATION	Hotel Adina, Amerika Plads 7, 2100 Kbh. Ø.		
SPONSOR	Hess		

January 16		MAIN SPEAKER	DINNER SPEAKER
TOPIC	<b>CO<sub>2</sub> Capture, Storage and EOR - The Weyburn-Midale Story</b>		A Generic Offshore CO <sub>2</sub> Injection Pilot Project, Morten Gjetting Stage, DONG E&P
SPEAKER	Carolyn K. Preston, Federal Department of Natural Resources Canada		
LOCATION	DONG Energy		
SPONSOR	DONG Energy		

February 19		MAIN SPEAKER	DINNER SPEAKER
TOPIC	<b>Game Changer: Enabling Global Innovation in Exploration and Production</b>		
SPEAKER	L.P. Roodhart, SPE Distinguished Lecturer		
LOCATION	Håndværkerforeningen, Dronningens Tværgade 2A, 1302 Kbh. K.		
SPONSOR	Shell		

March 25		MAIN SPEAKER	DINNER SPEAKER / DISCUSSION
TOPIC	<b>Enhanced Oil Recovery - Past and Future Enhanced Oil Recovery - Rock Mechanical Aspects</b>		Petroleum Engineering Education in Denmark: Perspectives and Challenges
SPEAKER	Erling H. Stenby and Alexander Shapiro - Ida L. Fabricius		
LOCATION			
SPONSOR	DTU		

April 23		MAIN SPEAKER	DINNER SPEAKER
TOPIC	<b>Lateral variability in chalk based on combined reflection and refraction seismics, nanofossil, cyclo- and chemostratigraphy - News from the Cretaceous Research Centre (CRC)</b>		
SPEAKER	Finn Surlyk and Lars Stemmerik, Department of Geography and Geology, University of Copenhagen		
LOCATION	GEUS		
SPONSOR	GEUS		

May 22		MAIN SPEAKER	ANNUAL MEETING
TOPIC	<b>Seismic Observation and Verification of Line Drive Water Flood Patterns in a Chalk Reservoir, Halfdan Field, Danish North Sea</b>		Per Bak, Section Chairman: Chairman Annual Report
SPEAKER	Ole Jørgensen, Mærsk olie og gas AS		
LOCATION	Mærsk olie og Gas AS		
SPONSOR	Mærsk olie og Gas AS		

June 20		MAIN SPEAKER	DINNER SPEAKER
TOPIC	<b>Summer party</b>		
SPEAKER	Per Bak, Section Chairman		
LOCATION			
SPONSOR	Schlumberger		

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# GameChanger: ENABLING GLOBAL INNOVATION IN E&P

COPENHAGEN  
**FEBRUARY**  
**MEETING**  
TUESDAY 19 FEBRUARY 2008

## ABSTRACT



GameChanger has been successfully enabling innovators and entrepreneurs in the Shell E&P technology centers to rapidly develop revolutionary ideas that are not a part of traditional incremental technology development. Radical innovation leads to technological advantage and a strong competitive position, leveraging the gain from our own internal innovation talent. This presentation demonstrates how innovators throughout the Shell E&P business have transformed our subsurface technology capability since the start of GameChanger in 1996.

GameChanger has been successful. Over five hundred ideas have been submitted since inception and many of these have progressed to deliver value to the business. A high proportion (80 %) of these ideas have been

aimed at enhancing our subsurface technology capability. Successful projects that have emerged include many elements of the Smart Wells technology, signal-to-noise improvement in sub-salt seismic data, and Light Touch as an exploration tool.

This presentation will highlight:

- Examples of breakthrough subsurface technologies that received seed funding through the GameChanger process.
- Mechanisms the GameChanger team utilizes to involve more staff as innovators (in the same way that the knowledge sharing networks currently successfully operate throughout the World).
- Examples of focused, breakthrough idea-generation workshops within operating units.
- How you can get beyond "SMART with Subsurface" technology through innovation

## BIOGRAPHY

Leo Roodhart is Manager Strategic Innovation in Shell GameChanger. GameChanger is Shell's Cross-Business Innovation programme, which executes and directs Shell's innovation strategy utilising the creativity of all Shell people. His background in Production Engineering where he published a large number of papers in the area of Well stimulation and Water management.

Leo Roodhart is an associate fellow of Templeton College, University of Oxford, holds an MSc in chemistry and a PhD in Mathematics and Physics from the University of Amsterdam. He works 24 years for Shell in various functions including research and development, exploration and production, business development and innovation in The Netherlands, Canada and the UK.



Meetings in the Geological Society of Denmark:

23. february 2008, Geocenter Kbh.  
DGF Annual Meeting. Full day program "Hot news from the Arctic"

More info at [www.2dgm.dk](http://www.2dgm.dk)

Organised by SPE Aberdeen Section

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### PROGRAMME

17:00 – 18:00  
Drinks and Poster Session

18:00 – 19:00  
Presentation and SPE news

19:00  
Dinner

### LOCATION

Håndværkerforeningen  
Dronningens Tværgade 2A  
1302 Kbh. K

### MAIN SPEAKER

L.P. Roodhart  
SPE Distinguished Lecturer

### TOPIC

Game Changer: Enabling  
Global Innovation in  
Exploration and Production

### ENTRANCE FEE

None

### REGISTRATION

Please indicate your attendance by  
15 February  
by signing up on the internet:  
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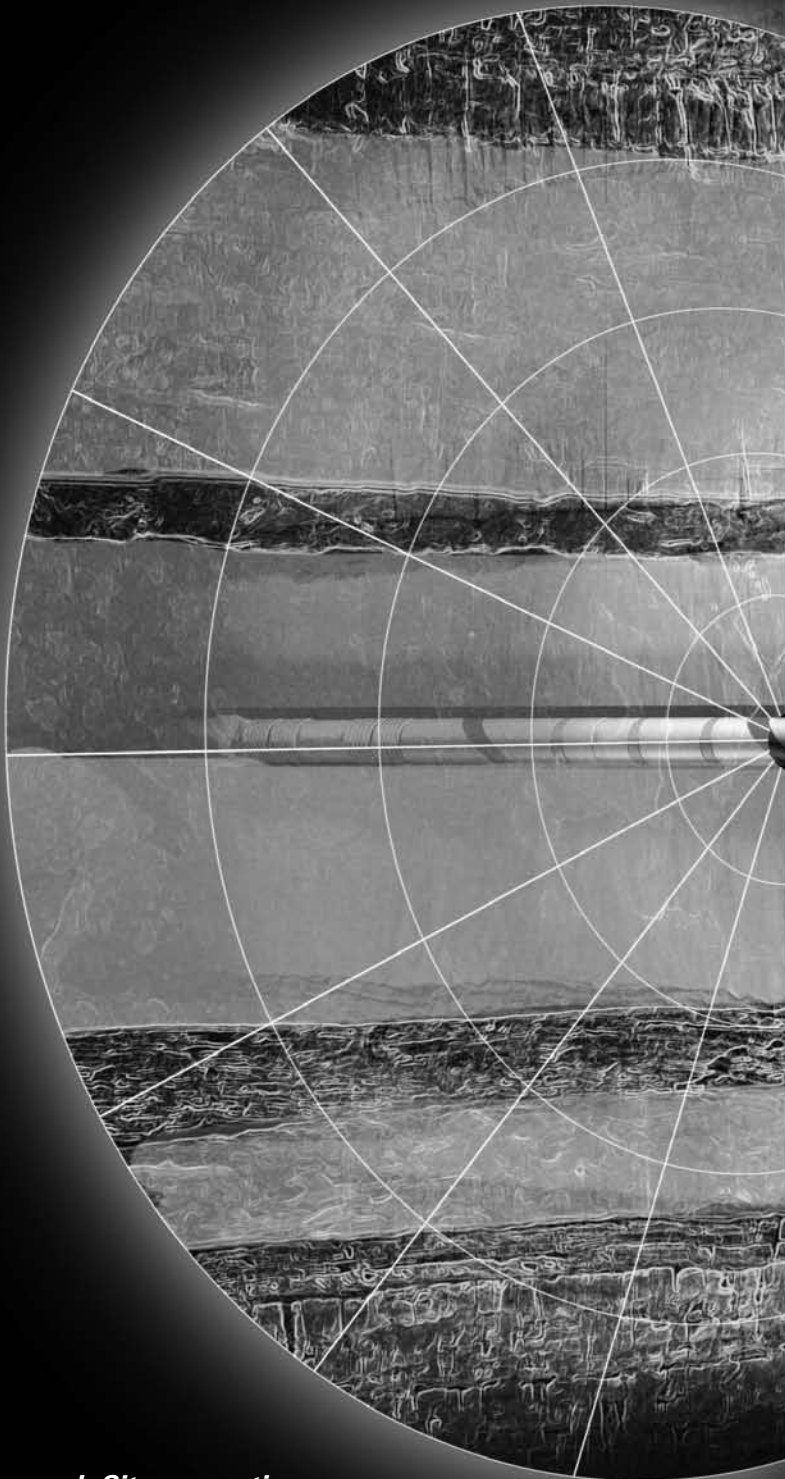
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