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SOCIETY OF PETROLEUM ENGINEERS

SPE NEWS

COPENHAGEN SECTION

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Welcome to the new 2012-2013 SPE COPENHAGEN SEASON

So here we are, after a three month summer break the new SPE Copenhagen section season is starting again. Thank you for reading this newsletter: as an SPE member you are part of an active and growing community. Our Copenhagen SPE membership grew more than 8% last year, exceeding targets on section growth and membership retention of 6.5 % and 90%, respectively. We did not even know such targets existed, so it was a nice surprise to be praised for this by the London based SPE membership office !

We have the pleasure of welcoming four new members to the SPE Copenhagen board. They are Kimmy Bauer (Baker Hughes), Jonathan Ovens (Dong), Jedrzej Bryla (Maersk, new Young Professionals representative) and Jonathan Hastings (Maersk, new Programme Chairman). We are grateful for the active contributions of volunteers and sponsors to SPE events and newsletters. The fact that no attendance fees are requested for our Copenhagen SPE lectures and dinners is entirely thanks to voluntary sponsorship by companies, institutes and individuals. Winston Churchill said: "We make a living by what we get, but we make a life by what we give." and we are fortunate that many people appear to agree with this in an SPE context.

The SPE lecture season will start with a September Distinguished Lecturer presentation at Shell's new Mikado office in Ørestad, next to the University of Copenhagen campus. The topics of the September lectures are 'Putting the Energy Industry in Perspective' by Distinguished Lecturer Phil Rae and 'Safety Management' by Odd Sevland. If you're looking for a reason to come, other than the fine presentations and dinner, then seeing these new offices from the inside is a great incentive. In the past Shell frequently used Moltkes Palæ for their sponsored event but following their move from remote Nærum to central North Ørestad this has changed.

The October presentations are kindly hosted by the DTU, and pre-dinner presentations will be made on topics related with EOR, renewable energy and model computation optimisation by PhD students Alsu Khusainova, Esther Rosenbrand and Andrea Capolei. And after dinner Alexander Shapiro will present an overview of large projects at the Center for Energy Resources Engineering (CERE).

Elsewhere in this newsletter you'll find a report on last June's SPE summer party that was held in the Copenhagen zoo. Sponsor Schlumberger dazzled the assembly with exquisite food and exceptional entertainment, making it a memorable event to the many tuxedoed and elegantly dressed participants. It certainly provided a refreshing perspective on the social aspects of the energy industry.

It's fair to say the above illustrates that SPE membership and networking can be instructive as well as enjoyable, and we hope you'll take advantage of the many opportunities before us this season !

Hans Horikx,
SPE Copenhagen section chairman.

SPE
COPENHAGEN SECTION

THE BOARD · 2012-2013 SEASON

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Shell

Shell History in Alaska & Shell in Alaska today

Shell has a long history in Alaska that dates back nearly 100 years. Shell was one of the original explorers in Alaska, including on the North Slope where Prudhoe Bay was eventually discovered. Even in the early years Shell was known as a company that specialized in the offshore. Ultimately, that would become our legacy in Alaska. Shell pioneered Alaska's Cook Inlet in the 1960's despite harsh forces of nature some considered too rugged to overcome. The platforms Shell installed were sold in 1998 but they are still producing today. Shell drilled the majority of the wells in the Beaufort Sea in the 1980s and 1990s and drilled four of the five wells ever drilled in the Chukchi Sea. Those wells were eventually capped.

Shell re-entered Alaska in 2005 after purchasing Outer Continental Shelf (OCS) leases in the Beaufort Sea. Subsequent lease sales netted Shell more acreage in the Beaufort. Today, Shell owns outright or holds an equity position in 137 Beaufort Sea lease blocks. In February 2008, Shell became the major leaseholder in the Chukchi Sea following Lease Sale 193 in which Shell bid a record $2.1 billion for 275 lease blocks. Since re-entering Alaska, Shell has spent nearly $4.5 billion preparing to drill again in the Alaska OCS.

World Class Potential in the Arctic and Alaska offshore

The Arctic holds some 22% of yet to be discovered global oil and gas resources, equivalent to some 400 billion barrels, mostly located offshore (84%). Shell believes that it is possible to responsibly develop the Arctic's resources in a way that safe guards the environment and respects the communities which may be impacted by Arctic development.

Conservative estimates from the USGS place roughly 25 billion barrels of oil and over 120 TCF of gas in the Alaska OCS. Against the backdrop of the roughly 16 billion barrels of oil that have been produced over the last 30 years on Alaska's North Slope, that kind of materiality is potentially a game-changer, not just for Shell and Alaska, but for United States as we consider the associated jobs and energy security that could come as a result of offshore production.



IN ALASKA

Finding Common Ground

The highest priorities for our plans in Alaska include keeping people safe and minimizing any negative impact on the environment or local communities.

Respect for the people, the sea, the animals and the environment are integral to our business plan. We are committed to operating safely and responsibly and will continue to meet or exceed regulatory requirements. Over the last five years, Shell has engaged in over 450 meetings with stakeholders to better understand their concerns and to hear their suggestions on how best to operate in the Arctic. We have learned from these engagements and changed our plans accordingly. Not only has Shell committed to being gone when traditional whale hunts take place, Shell also cut its drilling program in half after concerns were raised that the company was moving, “too fast, too much and too soon.”

The Right Science - done right

Since 1973, federal agencies have performed more than 5000 environmental studies to better understand the Alaskan OCS and coastal environment at a cost of over a half-billion dollars. While more science would be needed to move into the development and production stages, we believe the baseline is more than adequate to move forward with exploratory drilling.

A great deal of the science Shell is pursuing today is a result of an ongoing dialogue with North Slope stakeholders who have a vested interest in understanding more about the Arctic ecosystem. Additionally, Shell has recently signed an agreement with the North Slope Borough and NOAA to pursue, share and incorporate new science effective immediately.

Shell’s Science programme has advanced the understanding of marine ecosystems of the Chukchi and Beaufort Seas, marine mammal distribution, behavior, habitat use, and response to industry activities, and led to the development of new and better scientific methods.

Oil Spill Response

Shell has made oil spill prevention and response a huge priority. We have taken unprecedented steps to ensure we can operate safely and responsibly in the Arctic. In fact, the entire industry has committed itself to learning lessons from the Deepwater Horizon tragedy - including in Alaska. Together with the regulators, academics and other stakeholders, we have developed the highest standards for arctic drilling. This includes designing, constructing and operating wells in a safe and responsible way.



Our ethos of drilling in the Arctic is based on stopping any incident that would lead to a pollution event. We remain confident in our prevention measures and world-class, three-tier, oil spill response capability and we will continue to verify the strength and readiness of our plans. In Alaska, that includes advancing the engineering of a capping and containment system that would capture hydrocarbons at the source in the extremely unlikely event of a blowout. This system is modeled after the one that ultimately stopped the Macondo blowout in the Gulf of Mexico.

Technology

Drilling in Arctic and arctic-like conditions is not new - Industry has been in the Arctic for decades and through that has built up knowledge and understanding of the risks involved. We manage these risks through equipment and equipment selection, design practice, operational plans and procedures and preparedness. We have decades of research and development and experience dealing with operating in ice, ice management, shipping and logistics and continue develop technologies to advance oil spill response capability in ice, to reduce our operating footprint and impacts, and to improve the safety of operating in ice and extend capability to harsher conditions.

2012 Plans of Exploration

Our Chukchi and Beaufort Sea programs will be executed using two drill ships in shallow water, one in each sea; allowing Shell to begin to exploring its Alaska prospects after five years of delay. Our intention is to drill two wells 8,000 to 9,000 feet deep.In addition to this there is unprecedented program of supporting equipment, vessels and personnel on hand to ensure safe operations.

You can follow our efforts on www.shell.com/arctic

ABSTRACT

Putting The Energy Industry In Perspective

Energy is the most important commodity that defines the modern world. Without access to affordable energy, the economic health of the planet and the survival of our civilization itself, are at risk. This brief talk puts in perspective the importance of hydrocarbons - past, present and future – while also touching on alternative energy sources and their possible contribution as supplements or replacements for hydrocarbons, in the coming years.

We are certainly in a period of transition for our primary energy supplies– but that transition will be long and it will be both painful and unnecessarily expensive if we make the wrong decisions today. Vilified by politicians, environmentalists the media and even the wider public, the energy industry still has to power the world, exploiting existing reserves while trying to identify and develop newer discoveries. Against a backdrop of unrealistic eco-political promises, fanciful claims for wind and solar power, media disinformation and general public ignorance, our industry has to contend with issues as diverse as climate change, pollution and accusations of cost-cutting on important technical and HSE matters.

For those who want a more balanced view and want to be intelligent contributors to the debate on energy and the environment, this talk will be both enlightening and entertaining. Its conclusions may be surprising and disturbing but that does not make those conclusions any less compelling.

BIOGRAPHY



Phil Rae, Aberdeen University

A native of Aberdeen and a graduate of Aberdeen University, Phil Rae has been involved in the oil industry for over 30 years and has lived and worked in most regions of the world. He has wide-ranging theoretical and practical knowledge of oilfield operations. In addition to authoring some 40 SPE papers, Phil has also written numerous technical papers and articles for various oil and gas industry publications. He has been involved in the development of several key completion and stimulation technologies and holds several patents in these areas.

Phil has been a co-chair and committee member on several SPE Forums, Advanced Technology Workshops and Technical Conferences and served on the SPE Forum Series Implementation Committee – Western Hemisphere. Phil was the recipient of the SPE Asia-Pacific Regional Service Award for 2004 and the SPE Asia-Pacific Technical Award for Drilling and Completions in 2005 and was a Distinguished Lecturer in the 2004-5 Lecture Season.

Phil is the director of InTuition Energy Associates, a training and consulting company based in Singapore and is the Chairmen of the SPE Asia-Pacific Region Technical Advisory Committee.

SAFETY MANAGEMENT - LEARNT THE HARD WAY



Odd Sevland, Consultant

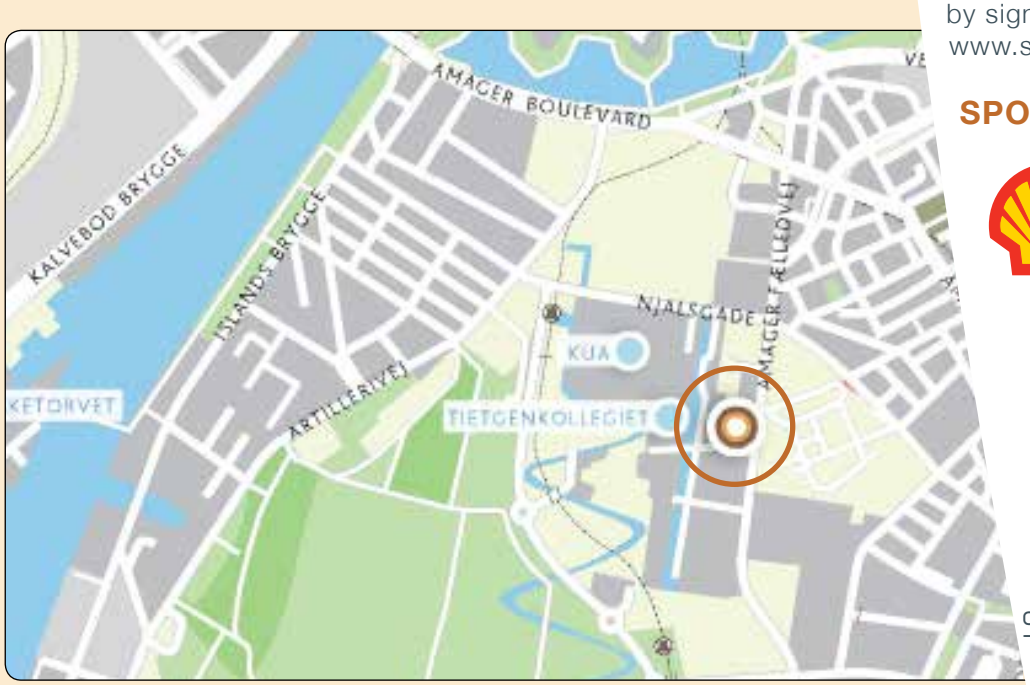
Mr Sevland has been actively working with safety and contingency planning since the late 80s at Sørlandets Sikkerhets Senter in Norway. He started as an instructor in fire and accident protection, first aid and accident prevention. Later he took over the position of HSE coordinator at the same establishment and remained there until 2005. He helped develop OLF's mandatory course for the oil industry, the Norwegian Maritime Directorate's STCW 95 course and NSO's course for land based industry.

Since 2005, he has been working as a presenter on behavioural training for the biggest industrial companies in Norway.

Recently he has helped in the development of Statoil's "Colleague programme" and ConocoPhillips "PSI programme", as well as many smaller programmes.

In summer of 1996, he was seriously burned at Sørlandets Sikkerhets Senter, where he was working as an instructor in fire and accident protection.
An extended stay in the burns unit at Bergen Hospital gave him plenty of time to think about his own behaviours.

The circumstances that led to him being seriously burned that day were all already in place, and he was the one who was mainly responsible for putting them there. This hard won experience is what he will share with us at the SPE meeting in September. ◄



COPENHAGEN
MEETING
THUESDAY 11 SEPTEMBER

SEPTEMBER

PROGRAMME
17:00 - 18:00
Drinks

18:00 - 19:00
Presentation and SPE News

19:00 - 21:00
Dinner

LOCATION
Mikado House
Rued Langgaards Vej 6-8
DK-2300 København S

SPEAKERS
Phil Rae, InTuition
Energy Associates Ltd
SPE DL

TOPIC
Putting the Energy Industry in Perspective

DINNER SPEAKER
Odd Sevland
Consultant

TOPIC
Safety Management
– learnt the hard way

ENTRANCE FEE
None

REGISTRATION
Please indicate your attendance by Thursday 6 September by signing up on the internet www.spe-cph.dk

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SPE MEETING SCHEDULE

2012-2013

September 11	MAIN SPEAKER	AFTER DINNER
TOPIC	**Putting The Energy Industry In Perspective**	Safety Management – learnt the hard way Odd Sevland
SPEAKER	Phil Rae - SPE DL, (InTuition Energy Associates Ltd)	
LOCATION	Shell Mikado House	
SPONSOR	SHELL	
October 24	**MAIN SPEAKER**	**AFTER DINNER**
TOPIC	**DTU Research**	Overview of the large projects at CERE – Center for Energy Resources Engineering, DTU Alexander Shapiro
SPEAKER	DTU Ph.D Candidates: Alsu Khusainova, Esther Rosenbrand and Andrea Capolei	
LOCATION	DTU, Building 101 B auditorium 1	
SPONSOR	DTU	
November 21	**MAIN SPEAKER**	**AFTER DINNER**
TOPIC	**Denmark's first HPHT development: Hejre**	Geosteering in thin injected sands by optimised operational setup and state-of-the-art LWD - Nini East Field Thomas Stærmose, DONG E&P
SPEAKER	Søren Poulsen, DONG E&P	
LOCATION	DONG	
SPONSOR	DONG	
January 14	**MAIN SPEAKER**	**AFTER DINNER**
TOPIC	**Hydraulic Fracturing of Horizontal Wells – Realizing the Paradigm Shift that has been 30 Years in Development**	Oil Gas Denmark Martin Naesby (Oil Gas Denmark)
SPEAKER	C. Mark Pearson - SPE DL, (Liberty Resources LLC)	
LOCATION	Moltkes Palæ	
SPONSOR	Hess	
February	**MAIN SPEAKER**	**AFTER DINNER**
TOPIC		
SPEAKER		
LOCATION	Maersk	
SPONSOR	Maersk	
March 7	**MAIN SPEAKER**	**AFTER DINNER**
TOPIC	**What Do We Have to Do to a Drilling Fluid to Maximise Well Productivity ?**	
SPEAKER	Stephen Vickers - SPE DL, (Baker Hughes)	
LOCATION		
SPONSOR	Chevron	
April	**MAIN SPEAKER**	**AFTER DINNER**
TOPIC	**History of Welltec and its impact on the oil industry**	
SPEAKER	TBD, Welltec	
LOCATION	Welltec	
SPONSOR	Welltec	
May	**MAIN SPEAKER**	**AFTER DINNER**
TOPIC	**Source Rock Potential in Denmark**	Annual General Meeting
SPEAKER	Henrik I. Petersen, GEUS	
LOCATION	GEUS	
SPONSOR	GEUS	
June	**MAIN SPEAKER**	**AFTER DINNER**
TOPIC	**SPE Summerparty**	
SPEAKER		
LOCATION		
SPONSOR	Schlumberger	


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MORE STUDENTS START AT THE Master Petroleum program at the DTU

DTU has seen a remarkable increase in the number of students starting at the Petroleum Master program. Approximately forty students, a third of them Danish, attend the program this year.






As the only University in Denmark with an ambitious master-level petroleum study program, we have been accredited by the Danish Ministry of Education.

As with all such initiatives, the job opportunities offered and onward careers of the students is a direct measure of the quality and success of the program. We are pleased to see that a great number of our graduates find jobs at large petroleum companies, both in Denmark and abroad, while others continue as Ph.D. students.

There are different possibilities for studies within the program, all free of charge for EU students. The full-scale 120 ECTS points program lasts two years, including a one-semester Master thesis. Students with a Master degree from other fields may pursue our Flexible Master program, which gives the second degree and with a 50% workload compared to the full program. The flexible solution is designed to accommodate the needs of the people already enrolled in the industry, who need to upgrade skills without compromising their job. The different courses of the Program may be taken separately, both by the DTU students following other programs and by external participants.

An important difference between the DTU Petroleum Master program and the “classical” petroleum education programs at other universities is the fact, that we do not offer a full-package five-year petroleum education. Instead we recruit Bachelor students from other areas and prime them to work with the petroleum industry at a Master level.

This is in correspondence with a strong trend we see in the industry itself, with a rising need of specialists with diverse backgrounds but robust knowledge of modern petroleum engineering. The goal of the program is to educate such specialists. The open structure provides the different possibilities to the students via the large number of the free-choice courses and an active effort to get the students to spend one semester at another university, getting a different experience and bringing it to the industry.

The measurable popularity of the program is partly due to an increasing intake of foreign students, mainly from the Southern Europe, and partly due to an increasing interest from Danish students from the DTU and the Copenhagen University. We believe that the strong efforts to establish close contacts with the industry, and the resulting lively exchange of ideas combined and high employment rates is the core of this increasing interest. In particular, the role of SPE and of the very active SPE Student Chapter established at the DTU is of enormous importance. The students appreciate the SPE facilitated opportunities to meet professionals and get a close look at real-world problems and challenges on site. We look forward to continue at expand this valuable exchange of knowledge, experience and talent.

EAST MEETS WEST 2012

Two Master and two PhD students from the SPE student chapter at the Technical University of Denmark (DTU) attended the 3rd annual SPE Student Congress “East Meets West” in Kraków, Poland from the 25-27th April 2012 (http://spe.net.pl/emw/). Our trip was graciously sponsored by the Center for Energy Resources Engineering (CERE) at DTU.

The goal of the congress is to gather most talented students, well-known academic professors and experienced professionals from world-wide companies in international discussion concerning challenges that petroleum industry is about to face.



The student organized event was arranged by the AGH University of Science and Technology student SPE chapter, and attracted Bachelor, Master and PhD student from various East and West regions, including: France, Germany, Denmark, Czech Republic, Hungary, Romania, Belarus, Ukraine and Russia. The congress was sponsored by Schlumberger, Halliburton, United Oil-field Services, Orlen Upstream, San Leon Energy and National Oilwell Varco. Guest speakers included Mr Alain Labastie (SPE International President for 2011) who presented an overview of future prospects and what to expect within the oil and gas industry.

Current student research at DTU was represented through Andrea Capolei (PhD), who was successful in winning first prize for his poster presentation entitled Production Optimization and Reservoir Management and Dariusz Lerch (MSc) who gave a presentation to the congress on Simulation and Optimization of Oil Production under Waterflooding of the Two-Phase Flow Reservoir Using Simultaneous Method and Interior Point Optimiser. The technical level of the congress certainly increased from last year and it continues to grow annually.

The Congress was a unique opportunity to create an international network with upcoming professionals within the field of petroleum engineering. The Congress also gave the student chapters a chance to share experiences and ideas on how to further our SPE student chapter locally and to promote further collaboration between students and industry.

The 4th Student Congress is scheduled to reoccur next year, and so we look to continue our strong East meets West representation again at Kraków in 2013.

Nathaniel Simpson,
SPE Student Chapter Secretary, s110920 student.dtu.dk

DTU RESEARCH



Alsu Khusainova, Ph.D student, DTU

Enzymatic Enhanced Oil Recovery

Introduction of biotechnologies into the field of enhanced oil recovery (EOR) is attractive as a relatively inexpensive and environmentally friendly method for increase of the oil production. According to recent laboratory studies, injection of enzyme solutions has shown quite positive and promising results in terms of the EOR. However, working mechanisms are poorly known and understood. Mechanisms in which enzymes may enhance extraction of oil from the reservoir rocks and obtained experimental results are going to be presented. ◄

SPE SUMMER PARTY
in the old elephant house

A VISIT TO A ZOO IS ALWAYS AN INTERESTING AND WORTHWHILE EXPERIENCE. BUT FEW OF US EXPECTED THE END OF SEASON SUMMER PARTY IN THE COPENHAGEN ZOO TO BE QUITE THE EXTRAVAGANZA IT TURNED OUT TO BE, EXCEPT PERHAPS THE GENE–ROUS SCHLUMBERGER STAFF WHO ORGANISED THE EVENT.



The early evening was warm and sunny and the SPE guests, in smart tuxedo and elegant dress, must have made an unusual impression on the other visitors of the Zoological gardens, mainly comprising families with young children. Those of us who arrived early had the opportunity to stroll through the gardens and visit landmarks such as the new elephant house, designed by the British architect Sir Norman Foster (also famous as the designer of the new Wembley stadium) before converging on the old elephant house for a glass of champagne and a chat with friends.

The inside of the old elephant house had been converted to a restaurant following the elephants' move to their new residence and the venue was remarkably elegant and stylish. After Dave Harrison's introduction speech the party started and evolved into an appealing spectacle of candles, cages, 3-course dinner and a charming female opera singer accompanied by a piano player behind bars. It was a sight that many will remember a long time. Speeches by the old and new section chairmen and drinks in one of the cages, converted into a bar for the occasion, concluded the evening.

The party was a milestone in the rich tradition of using original locations for this event. It will be interesting to learn what the summer party organiser's will find next year !

On another note, the professionalism of the Zoo's staff was praiseworthy. They personally accompanied each of us to the exit of the gardens as a safety measure. Only a month later we were reminded of the wisdom of such a policy as an (uninvited) night-time visitor to the zoo was killed in the Siberian tigers' enclosure. A reminder that HSE should always be on our mind.



Esther Rosenbrand, Ph.D student, DTU

Effect of Hot Water Injection on Sandstone Permeability: An Analysis of Published Experimental Data.

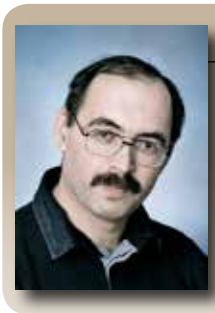
The seasonal imbalance between supply of and demand for renewable energy requires temporary storage, which can be achieved by hot water injection into warm aquifers. This requires that the permeability and porosity of the aquifer are not reduced significantly by heating. Experimental data from a range of different sandstones show that heating can cause a permeability reduction that to a large extent is reversible upon cooling. The effect of temperature is only found in clay bearing sandstones when these are saturated with water or brine; not with mineral oil or gas. This would suggest that heating contributes to fines mobilization. ◄



Andrea Capolei, Ph.D student, DTU

Mathematical Methods for Oil Reservoir Production Optimization

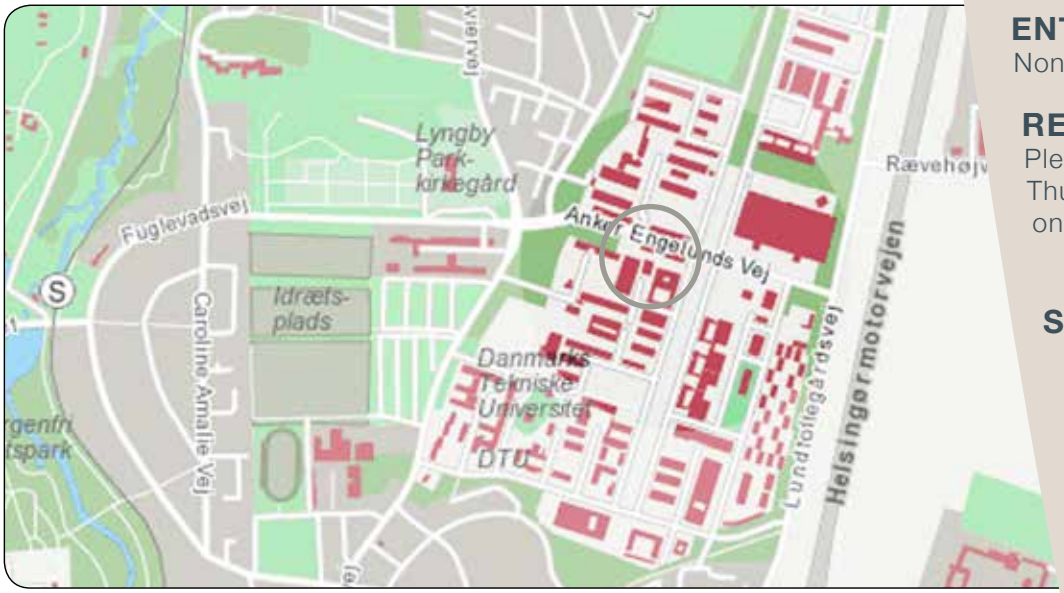
The mathematical methods are applied to optimize the waterflooding in a petroleum reservoir. The real-time distribution of water injection flowrates in the different parts is optimized in order to account for reservoir heterogeneity and to provide more even displacement. In production optimization, computation of the gradients is the computationally expensive step. We improve the computational efficiency of such algorithms by improving the gradient computation using high-order ESDIRK (Explicit Singly Diagonally Implicit Runge-Kutta) temporal integration methods and continuous adjoints . The high order integration scheme allows larger time steps and therefore faster solution times. ◄



Alexander Shapiro, Associate Professor, DTU CERE

OVERVIEW OF THE LARGE PROJECTS AT CERE

Center for Energy Resources Engineering, DTU



COPENHAGEN MEETING

WEDNESDAY 24 OCTOBER

OCTOBER

PROGRAMME

17:00 - 18:00
Drinks

18:00 - 19:00
Presentation and SPE annual general meeting

19:00 - 21:00
Dinner

LOCATION

Building 101 B auditorium 1
and DTU Faculty Club (dinner)
Anker Engelundsvej 1
2800 Kgs. Lyngby

SPEAKERS

Alsu Khusainova,
Esther Rosenbrand
and Andrea Capolei
PhD students, DTU

TOPIC

Enzymatic Enhanced Oil Recovery, Effect of Hot Water Injection on Sandstone Permeability: An Analysis of Published Experimental Data, and Mathematical Methods for Oil Reservoir Production Optimization

DINNER SPEAKER

Alexander Shapiro
Associate Professor, DTU

TOPIC

Overview of the large projects at CERE – Center for Energy Resources Engineering, DTU

ENTRANCE FEE

None

REGISTRATION

Please indicate your attendance by Thursday 18 October by signing up on the internet www.spe-cph.dk

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FASETT



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