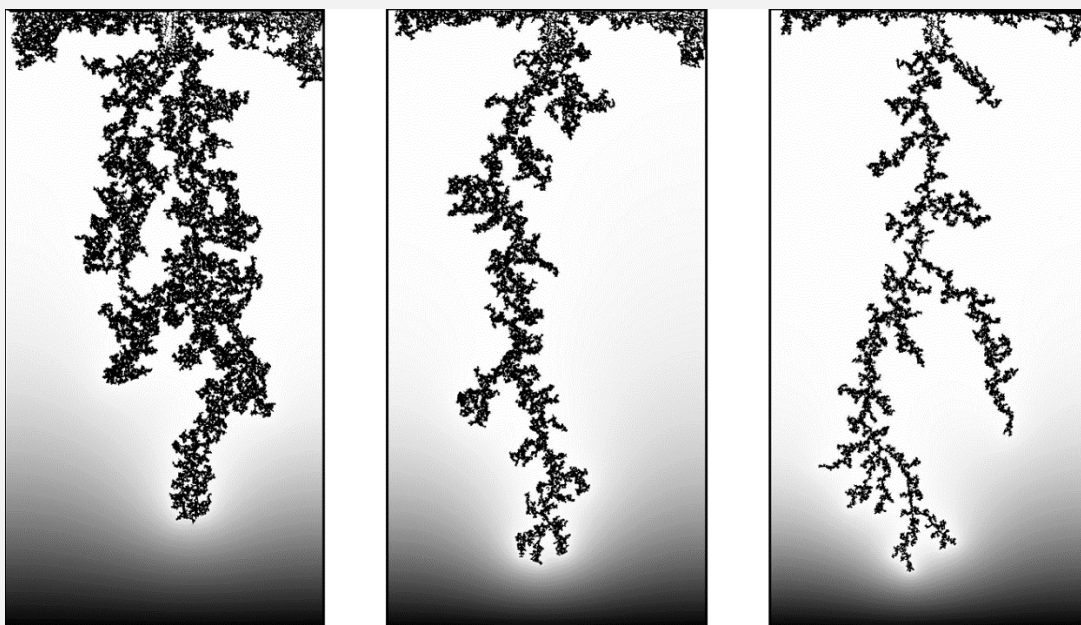


## Newsletter 3 - 2018



**PoreLab**  
NTNU-UiO Porous Media Laboratory

*ff*  
Norwegian  
Centre of  
Excellence  
The Research Council of Norway

 **NTNU**  
Norwegian University of  
Science and Technology



**UiO** : **University of Oslo**

## The celebration of the opening of our new premises in Trondheim



The official Norwegian Centre of Excellence plaque was presented to Centre Director Alex Hansen from Senior Adviser Liv Furuberg from The Research Council of Norway. The seminar in Trondheim was official opened by the State Secretary Rebekka Borsch from Kunnskapsdepartementet (Norge). Researchers, students, representatives from NTNU and others showed up to celebrate PoreLab.



Knut Jørgen Måløy, Signe Kjelstrup, Eirik Grude Flekkøy, Alex Hansen, Ole Torsæter and Liv Furuberg. (Photo: Marie-Laure Olivier)

## SPE price to professor Ole Torsæter

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Society of Petroleum Engineers (SPE) has awarded the "Society of Petroleum Engineers North Sea 2018 Regional Management and Information Award" to Professor **Ole Torsæter**. This award is an acknowledgement of his outstanding contribution in this area at the regional level. Congratulations!

## The Lars Onsager Professorship

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### The Onsager Medal

The Onsager Lecturer and the Onsager Professor receive the Onsager Medal.



The recipient of the Lars Onsager Professorship is to spend 3–6 months at NTNU to collaborate with scientists at the university. This year Daan Frenkel will be the Onsager professor, working with Professor Signe Kjelstrup and PoreLab.

The Norwegian University of Science and Technology NTNU sponsors the annual Lars Onsager Professorship.

## Starts student exchange with China

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Monday and Tuesday last week, a group of researchers from the CSRC in Beijing visited NTNU.

Head of the research centers looking for projects to collaborate on.

[Universitetsavisa](#) (Norwegian)

## Welcome Astrid and Kim Roger!

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Astrid Fagertun Gunnarshaug and Kim Roger Kristiansen are new doctoral fellows in PoreLab. They will have their first day with us August 13. They were honoured for their master degrees at a celebration in May. Supervisor: Professor Signe Kjelstrup,

Astrid's title on her master was *Thermoelectric Properties of Non-Aqueous Electrochemical Cells - Local Reversible Heat Effects Relevant for Lithium Ion Batteries*.

Kim Roger's title on his master was *Coupled Transport of Heat, Mass and Charge in Ion Exchange Membranes - Aqueous Chloride Systems Relevant for Harvesting of Low-Grade Waste Heat*.

## Welcome back Marie-Laure!

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Marie-Laure Olivier is back from sick leaves on 30.07.2018 and replaces therefore Anette Havmo who was her deputy for the position of administrative leader/coordinator for PoreLab.

Marie-Laure holds a master degree within energy from the Ecole Polytechnique Féminine in France from 1990. She worked 5 years as engineer in Framatome, the French constructor of nuclear power plants, mainly on fluid system equipment, thermal processes and thermomechanical calculations and modelling.

She got a one-year fellowship from the Marie Curie program in 1996 and came to NTNU as research scientist to work on EOS for hydrocarbon systems.



She decided then to pursue her studies through a PhD at the department of refrigeration and air conditioning in a combined NTNU/SINTEF B contract. Her PhD was related to non-equilibrium mass and heat transfer computation in multiphase hydrocarbon system. In 2002 she joined SINTEF Petroleum Research, at first as research scientist in the reservoir technology department before becoming the research director of the department in 2006 newly merged with the geophysics department. In SINTEF Petroleum Research, she worked mainly with gas diffusion, IOR/EOR and CO<sub>2</sub> storage. In 2011 she became head of department for the chemistry department at NTNU until August 2017 when she joined the PoreLab team.



## NEWLY PUBLISHED ARTICLES

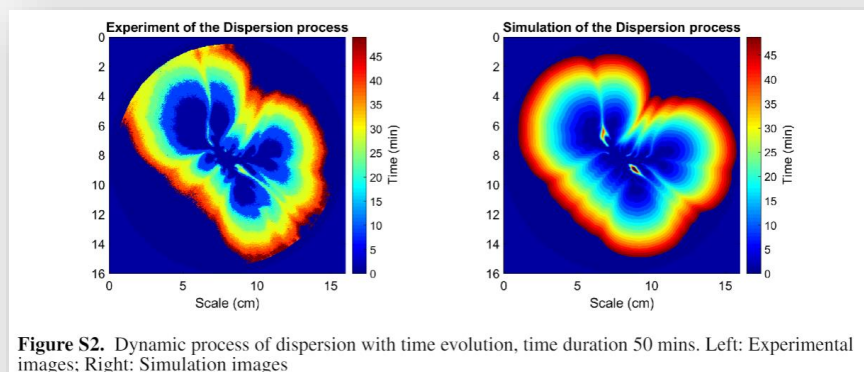
### Dispersion in Fractures With Ramified Dissolution Patterns

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Le Xu, Benjy Marks, Renaud Toussaint, Eirik Grude Flekkøy and Knut Jørgen Måløy (2018).

**Frontiers in Physics.**

The injection of a reactive fluid into an open fracture may modify the fracture surface locally and create a ramified structure around the injection point. This structure will have a significant impact on the dispersion of the injected fluid due to increased permeability, which will introduce large velocity fluctuations into the fluid. Here, we have injected a fluorescent tracer fluid into a transparent artificial fracture with such a ramified structure. The transparency of the model makes it possible to follow the detailed dispersion of the tracer concentration.



### Performance analysis of heat and energy recovery ventilators using exergy analysis and nonequilibrium thermodynamics

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Gjennestad, Magnus Aashammer; Aursand, Eskil; Magnanelli, Elisa; Pharoah, John George. (2018).

**Energy and Buildings. vol. 170.**

The increased attention to energy savings has contributed to more widespread use of energy recovery systems for building ventilation. We investigate the efficiency of such systems under different outdoor conditions using exergy analysis and nonequilibrium thermodynamics. This analysis makes it possible to assess performance in terms of loss of work potential, to account for the different quality of energy and to localize and compare the different sources of loss in the system. It also enables the use of exergy efficiency as a single performance parameter, in contrast to the several indicators that are commonly used.

*Improving the Monte Carlo Algorithm for Pore-network Simulations of Immiscible Two-Phase Flow in Porous Media.*  
Santanu Sinha and Alex Hansen

## PoreLab's first PhD thesis

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Magnus Heskestad Waage has submitted the following academic thesis as part of the doctoral work at NTNU June 19: *Molecular Simulations of Gas Hydrates: Stability and Transport Properties*.

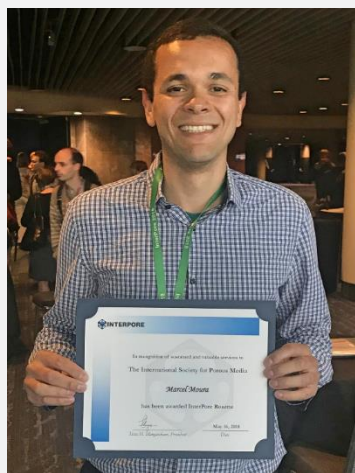
The doctoral work has been carried out at the Department of Chemistry, where Professor Signe Kjelstrup has been the candidate's supervisor.

### Summary of thesis:

At high pressures, mixtures of water and gas can form a crystalline compound called a gas hydrate. A considerable amount of methane hydrate exists at the sea floor and in permafrost regions. It is desirable to harvest this methane, either by dissociating the hydrate, or by replacing the methane with carbon dioxide. The latter option holds an advantage of elegance, as well as potentially leading to a reduced environmental impact on the hydrate's surroundings. To perform the exchange in a timely manner, it is necessary to understand the microscopic mechanism of the gas exchange. This work presents molecular Monte Carlo simulations of gas hydrates, in which we study the stability of the hydrate, and the transport of gas molecules in the bulk of the hydrate.

## Conference New Orleans

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A large group of PoreLab members attended this year's InterPore meeting in new Orleans. Olav Galteland, Marco Sauermoser and Marcel Moura led an interactive game in partnership with *Perspectivity*. In the game the participants had to tackle the dilemmas that shape the future of energy, water and food. The game was very well received and we intend to repeat a similar setting during next year's InterPore meeting in Spain. The game is one of the the student activities organized by the Student Affaires Committee of InterPore, which counts 4 PoreLab members: Marcel, Olav, Marco and Seunghan.

Alex Hansen was one of the speakers in the career development event. He spoke to the wide global community of Poreous Media students and postdocs about the everyday life of a researcher in academia. He gave some very direct insights into the challenges faced by researchers in the field and how to tackle them. He was joined in the career event by Martin Blunt (Imperial College london), Sarah Codd (Montana State University and PoreLab collaborator) and Veronika Schleper (Bosch, Germany).

Marcel Moira and Alex Hansen have been awarded the InterPore Rosette award "In recognition of sustained and valuable service to The International Society for Porous Media".

After the meeting the PoreLab group joined an unusual local activity: An alligator safari!

(Text: Marcel Moura)

## Any other business..

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**Gallery:** Here's the link to the Gallery where we are collecting the porous media related pictures and videos: <https://www.flickr.com/photos/porousmediaart/>. If you have anything that you would like to have posted in the Gallery, please contact Marcel Moura.

**PoreLab templates:** Marco Sauermoser has made some new PoreLab templates. You find them in [Dropbox](#).

