

# Department of Petroleum Engineering

---

Research and Education



---

University of  
Stavanger



University of  
Stavanger

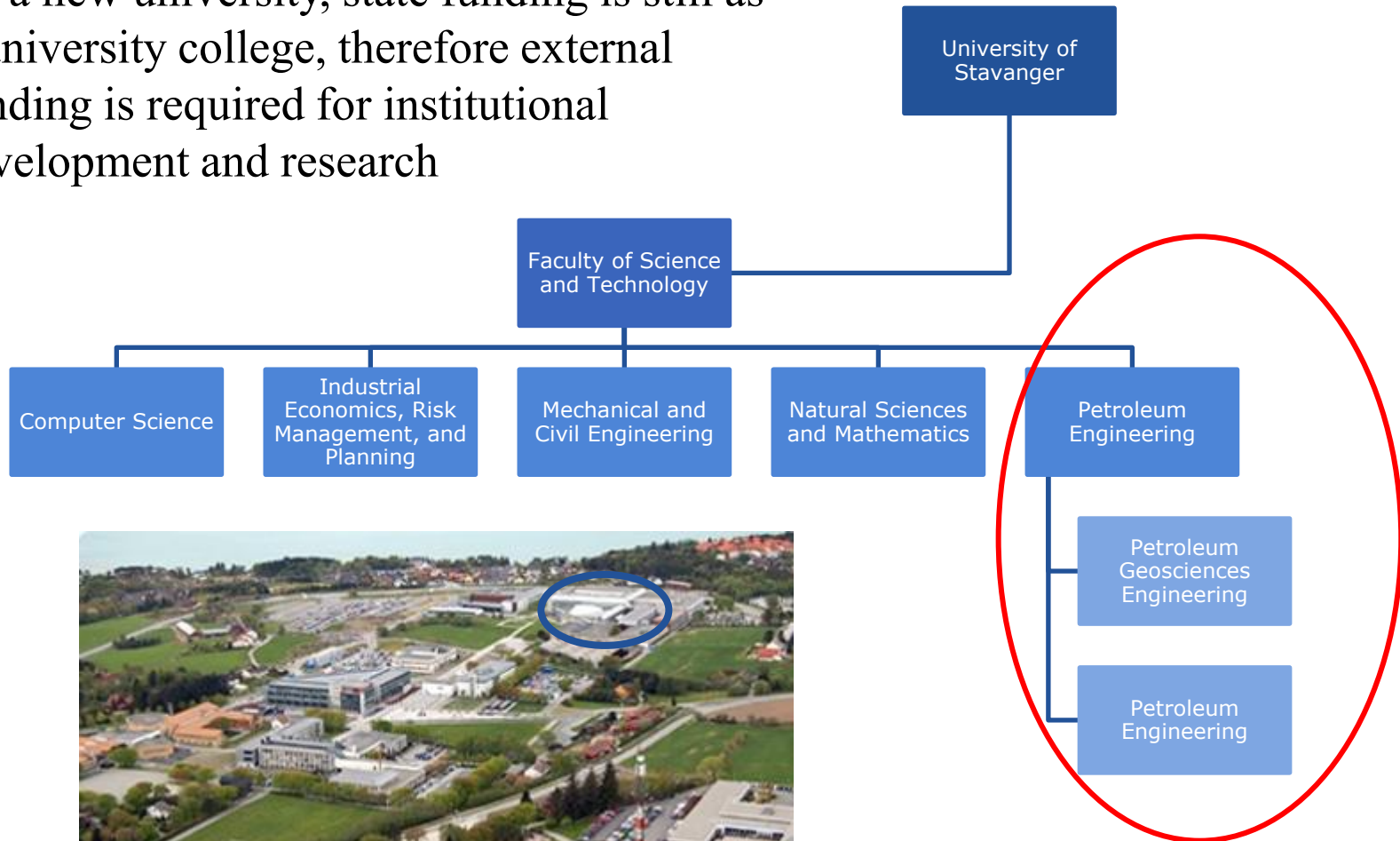
# Universitetet i Stavanger

- Ca 1000 Employees
- Ca 8000 students
- 3 faculties + Archeologic museum
- 17 departments
- 8 PhD programs
- Collaboration with research institute IRIS



# University Structure, Petroleum engineering and Petroleum Geosciences

As a new university, state funding is still as a university college, therefore external funding is required for institutional development and research





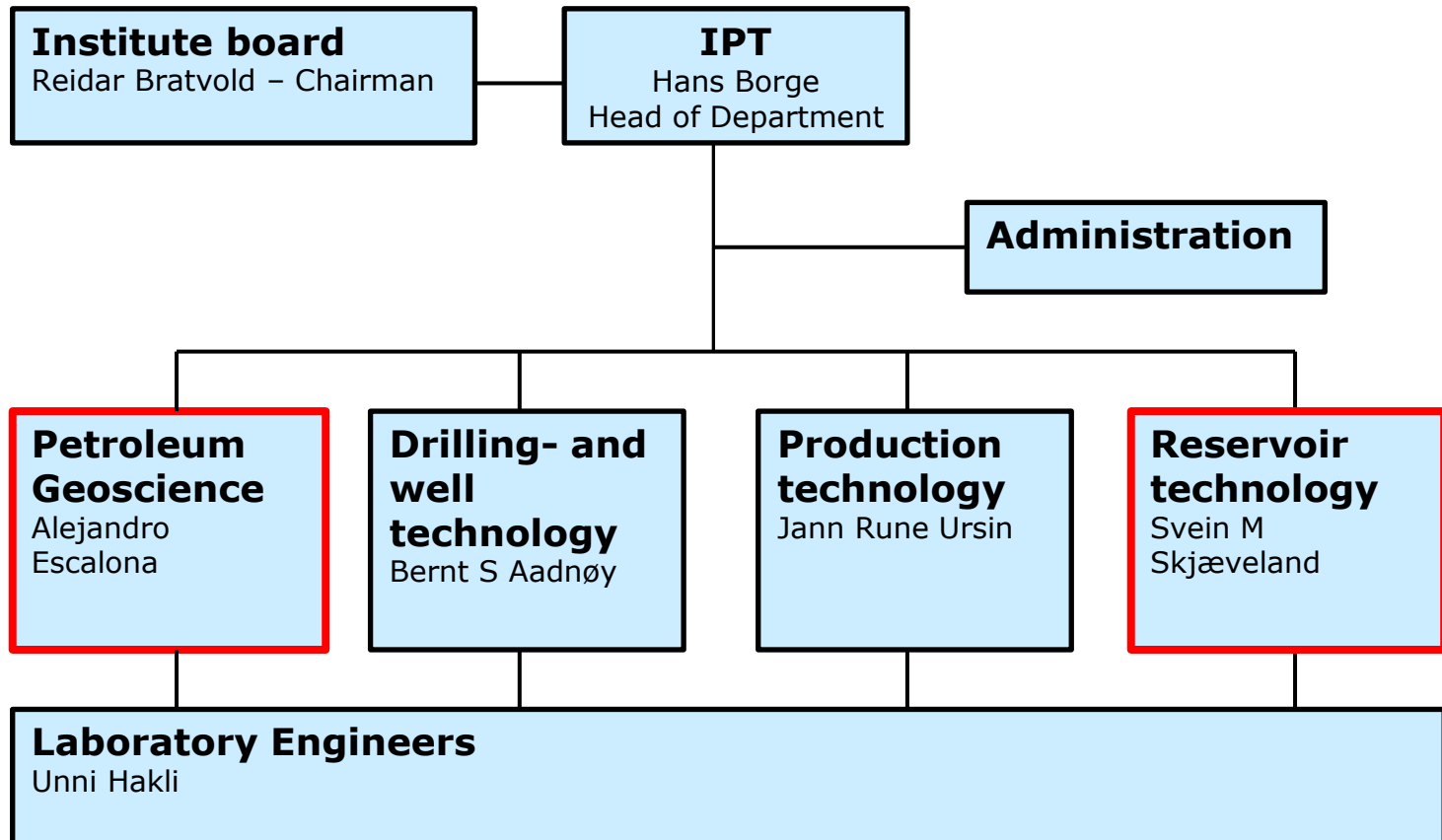
# Department Research Philosophy

---

- Focus on the integration of petroleum activities from geosciences to engineering
- Increase expertise in a broad range of applications, from the study and modeling of reservoirs in the field and in subsurface data to the process of making decisions
- Conduct theoretical and applied research in key areas to increase competence and reduce the risk in the exploration and exploitation of hydrocarbons and other natural resources

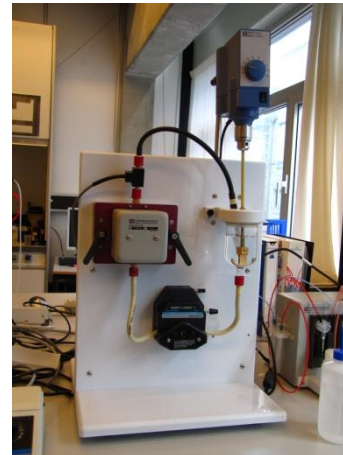
# Organisasjon - IPT

- Administrative staff 5
- Scientific staff 26
- Scientific II-positions 14
- Engineers 11
- Research fellows, PostDocs & Ass 21



# Laboratories

- 11 Engineers
- 29 different laboratories
- Form a "supporting beam" in research and education at the institute





# Study programs

---

## 3 year Bachelor

Petroleum Engineering

Petroleum Geosciences engineering

## 2 year Master of Science

Drilling Engineering

Reservoir Engineering

Natural gas technology engineering

Petroleum Geosciences

## PhD



# MSc in Petroleum Reservoir Engineering: 2 Year Course Load

<b>1 Fall</b>	<b>Reservoir and geological engineering (10 sp)</b>	<b>Directional drilling and flowing well engineering (10 sp)</b>	<b>Computational reservoir and well modelling (10 sp)</b>
<b>2 Spring</b>	<b>Geostatistics and Decision analysis (10 sp) Or</b>	<b>Improved recovery methods (10 sp)</b>	<b>Core scale modelling and interpretation (10 sp)</b>
	<b>Reservoir chemistry (10 sp)</b>		
<b>3 Fall</b>	<b>Reservoir simulation (10 sp)</b>	<b>Reservoir geomechanics (10 sp)</b>	<b>Formation evaluation and well testing (10 sp)</b>
<b>4 Spring</b>	<b>Master thesis (30 sp)</b>		



# MSc in Petroleum Geosciences Engineering: 2 Year Course Load



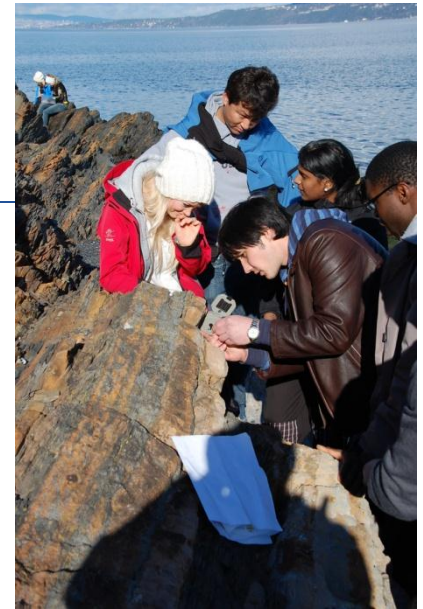
University of  
Stavanger

<b>1 Fall</b>	<b>Depositional systems and sequence stratigraphy (10 sp)</b>	<b>Structural styles and basin analysis (10 sp)</b>	<b>Seismic reflection methods (10 sp)</b>
<b>2 Spring</b>	<b>Geostatistics and Decision analysis (10 sp)</b>	<b>Seismic interpretation (10 sp)</b>	<b>3D reservoir modeling (10 sp)</b>
<b>3 Fall</b>	<b>Applied geosciences methods (10 sp)</b>	<b>Petrophysics and seismic analysis (10 sp)</b>	<b>Thesis seminar (10 sp)</b>
<b>4 Spring</b>	<b>Master thesis (30 sp)</b>		

# Field trips

## Two introductory

- Introductory excursion to understand and observe basic structural geology and different types of rocks (Oslo graben)
- Earth history and introduction to sedimentology (Bornholm (DK), Harz (DE). Location may vary from year to year).



## Three specialization

- **Understanding an orogen and petroleum plays** (Central Iberia, Cantabrian mountains, Italy, Pyrenees; Location may vary from year to year).
- **Understanding hydrocarbon-bearing rock successions in the geological context**(Central Iberia, Cantabrian mountains, Italy, Pyrenees; Location may vary from year to year).
- **From rock to model:** Understanding modern analogs of rift structures in the field followed by reservoir modeling (Corinth's Gulf, Greece)



# Geosciences faculty

7 permanent assoc/prof  
6 adjunct assoc/prof from industry  
2 technicians

George

Carita



Rodmar





University of  
Stavanger

---

# Research projects, strenght areas

# Research areas within Reservoir Engineering

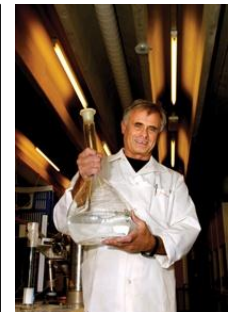
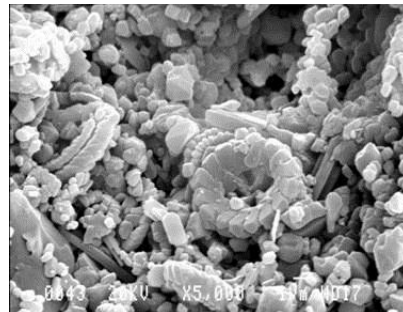
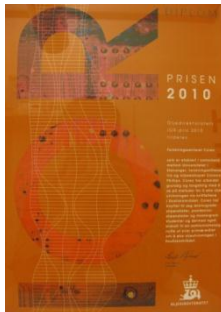
---

- **Wettability:** smart water, low salinity injection
- **Modelling:** simulation models, pore network modelling, dynamic wettability alteration, geochemistry, etc
- **Rock Mechanics:** water weakening of chalk, rock fluid interactions
- **Upscaling:** submicron scale - molecular forces, pore scale, Darcy scale, reservoir scale, increase recovery

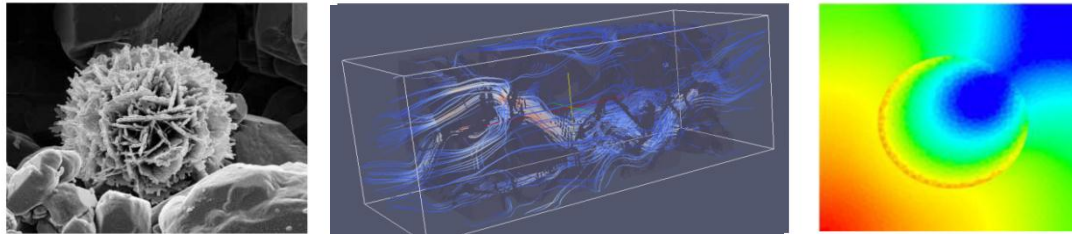


# Increased recovery: Corec

- Co-operation between IRIS and UiS
- Rewarded NPDs IOR-price 2010
- The research shall contribute to reach the goal of a mean recovery equal to 55%
- Corec has contributed to increase the intended recovery at the Ekofisk field
- Publications and 8 PhD-dissertations



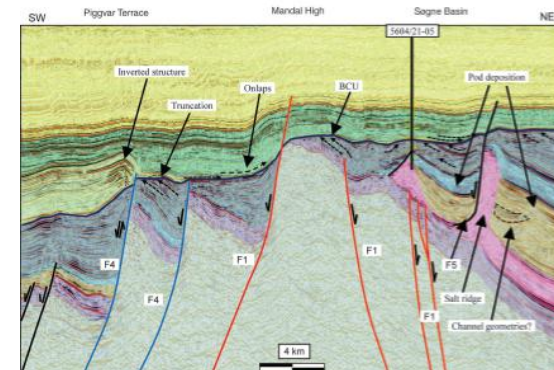
# Joint application: National IOR Centre



- › Research Centre for improved recovery of petroleum resources on the Norwegian Continental Shelf
- › Announced by the Research Council of Norway, deadline for application is May 29, 2013
- › Strategic priorities
  - Cooperation, also internationally
  - Implementation of best practice and new technology
  - Openness
  - Recruiting, education
  - Environmental aspects
- › Thematic priorities
  - › **Immobile oil and EOR-technologies**
  - › **Mobile oil: Reservoir characterisation for better volumetric sweep**

# Research areas within Geosciences

- Regional to reservoir scales studies using surface and subsurface data
- Subbasalt geophysics and multicomponent seismology
- Geographic information systems
- Provenance studies and paleoclimate
- Structural modeling
- Decision analysis, resource management, geostatistics and uncertainty modeling







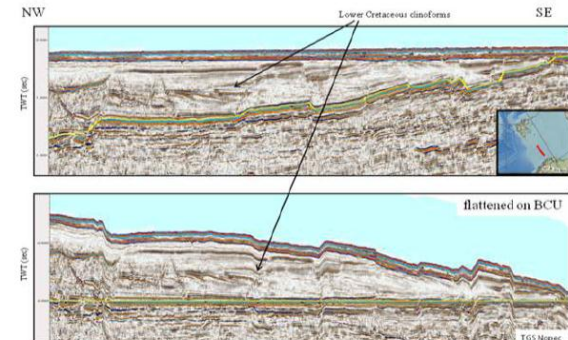
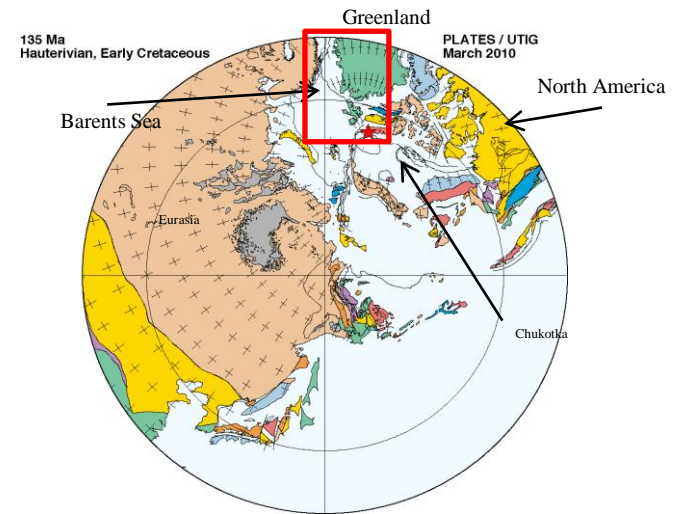
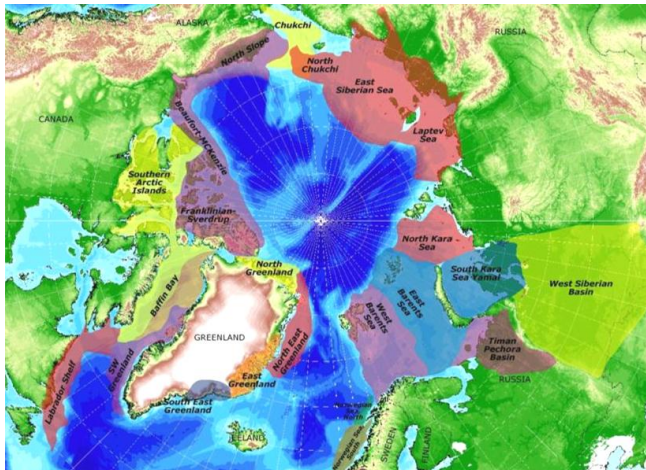
# Lower Cretaceous clastic wedges – an under-explored play in the Arctic.

## LOCRA

UiS and UNIS in cooperation with UTIG, UiO, UiB, MSA, MSU, CPH

*Built in close cooperation with FORCE*

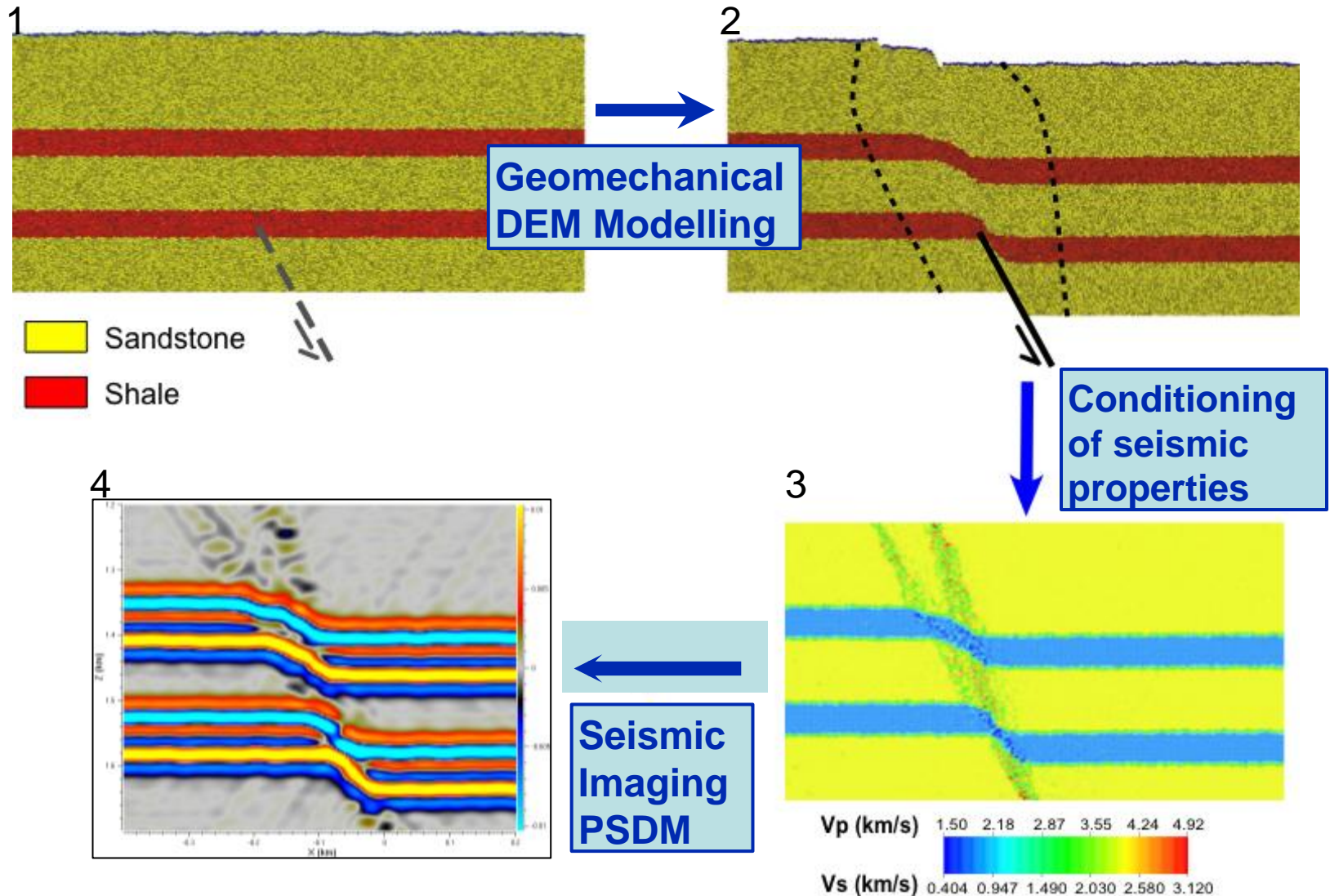
**Main project goal :** to improve the basin configuration and fill of the Lower Cretaceous basins in the high Arctic as input to prediction of coarse grained siliciclastic wedges as plays on the Norwegian Continental Shelf.



# Seismic Imaging of Fault Zones

A framework to study fault related deformation and its impact on seismic, as well as the seismic acquisition and processing parameters required to image fault zones. (NFR)

In cooperation with NORSAR and University of Barcelona



# Research in hydrocarbon-related topics

## Udo Zimmermann

- Chalk and chert successions in eastern Italy and Northern Ireland as equivalents of the Chalk Group in the North Sea

---

- High resolution heavy mineral stratigraphy and reservoir characterisation on undeformed and unmetamorphosed selected sandstone successions on Bornholm (Denmark)
- Sandstone provenance



# Exploring beneath basalt cover: A challenge!

Jim Brown

Improving seismic imaging

