AGENDA – ROSE meeting 23-24th April 2012

Location: P1 in PTS1, S.P. Andersens veg 15, Trondheim.

Monday 23rd April

09:30 Coffee and registration
09:50 Welcome

Session 1: Rock physics

10:00 Rock physics analysis and time-lapse rock imaging of the induced chemo-mechanical processes upon CO2 injection into reservoir rocks, *Tiziana Vanorio, Stanford University*
10:20 CO_2 deposition: Effect of carbonate dissolution on reservoir rock integrity, *Kristian Eide, NTNU*
10:40 Static and dynamic moduli, dispersion and brittleness of shales and shale wannabes, *Rune M Holt, NTNU/ SINTEF*
11:00 Comparison between static and dynamic behavior measured in Triaxial and Oedometric test systems*, NTNU, Mohammad Hossein Bhuiyan, NTNU*
11:20 Source rocks from seismic – principles and applications, *Kenneth Duffaut, Statoil*
11:40 Temperature dependence of acoustic waves in shales, *Andreas Bauer, SINTEF*

12:00 **LUNCH**

12:50 Water in clay and shale: Molecular scale and rock physics modelling versus experiments, *Morten Kolstø, NTNU (& HiST)*

Session 2: Modeling

13:20 Curved edge diffraction modeling, *Tijmen Moser, MGS*
13:40 Efficient 3D elastic FD modeling*, Jon Marius Venstad, NTNU*
14:00 Comparison of numerical seismic modeling results with acoustic water-tank data*, Anastasiya Tantsereva, NTNU*
14:20 Nonlinear elastic wave propagation in a dry weak sandstone, *Anna Stroisz, NTNU*
14:40 The normal modes periodic equation for anisotropic seabed conditions*, Lyubov Skopintseva, NTNU*

15:00 **Coffee break**

Session 3: Anisotropy and signal enhancement

15:20 Bandwidth enhancement: Time-varying Wiener deconvolution or inverse-Q filtering?, *Mirko van der Baan, University of Alberta, Canada*
15:40 Ground roll suppression using optimal weighted stacking, *Olena Tiapkina, NTNU*
16:00 Minimum-delay seismic trace decomposition with application to ground-roll attenuation, *Bjørn Ursin, NTNU*
16:20 Wave propagation in dip constrained TI media, *Pavel Golikov, NTNU*
16:40 Low-frequency layer-induced anisotropy, *Alexey Stovas, NTNU*

19:00 Dinner, Palmehaven, hotel Britannia, Dronningens gt. 5

Tuesday 24th April

Session 3: Time lapse and reservoir characterization

08:40 Rock physics modeling and analysis of 4D time shifts – Visund Sør, *Per Avseth, Odin Petroleum/NTNU*
09:00 Time-lapse seismic comparisons using pre-stack imaging and complex wave field comparisons to improve accuracy and detail, *Paul Stoffa, University of Austin*
09:20 Estimating pressure and saturation changes from 4D traveltime shifts and a simple pseudo steady state flow equation, *Martin Landrø, NTNU.*
09:40 Pressure-saturation discrimination for the underground blow out data, *Tuhin Bhakta, NTNU*

10:00 **Coffee break**

10:30 Pressure-saturation discrimination applied to the Snøhvit CO2 data set, *Sissel Grude, NTNU*
10:50 Interpolating subsequent 3D seismic data sets at the Sleipner CO2 storage site, *Anders Kiær, NTNU*
11:20 Time lapse refraction analysis and full wave form inversion, *Hadi Balhareth, NTNU*
11:40 Simple expression for the bubble-time period of two clustered air guns*, Daniel Barker, NTNU*

12:00 LUNCH

Session 4: Imaging and inversion

13:00 Full waveform inversion in the image and data spaces, *Børge Arntsen, NTNU*
13:20 Modeling and migration of dual-sensor marine seismic data, *Reynam Pestana, UFBA*
13:40 Spatial gradient marine seismic sources and their applications, *Johan Robertsson, ETH-Zurich*

14:00 **Coffee break**

14:30 Kinematic time migration and demigration of reflections in prestack seismic data, *Einar Iversen, Norsar*
14:50 Reverse-time migration velocity analysis – A real field data example, *Wiktor Waldemar Weibull, NTNU*
15:10 3D inversion of EM data, *Lutz Mutschard, NTNU*
15:30 Resolution of 3D elastic full waveform inversion, *Espen Nilsen , NTNU*

16:00 Discussion and adjourn

25th -26th april: Course on geomechanics, P1, 8:30 ***Erling Fjær and Rune Holt. (course description on next page). Course ends at 17:00 26th April***

GEOMECHANICS FOR GEOPHYSICISTS

a 2day course
by

***Rune Martin Holt & Erling Fjær**, 25-26th April 2012,*
auditorium P1 at 08:30, PTS building, NTNU

Geomechanics has attracted growing awareness in the petroleum industry, also within seismics and rock physics, in later years. It is now widely accepted that dominant features observed in time lapse seismic originate from geomechanical processes, hence interpretation of such data require basic geomechanical knowledge. On the other hand, there are also significant efforts to utilize seismic data for estimation of geomechanical information such as rock stiffness, stresses and pore pressure. This requires essential knowledge about both rock physics and geomechanics, as well as the links between these disciplines.

This course will cover the following subjects:

Elementary rock physics. Knowledge on how seismic velocities depend on stress, and how they relate to static mechanical properties, is essential for all studies on this subject. Observations and models will be presented, and elementary physical explanations will be offered.

Rock stresses and pore pressure. The origin of Earth stresses and pore pressure will be explained, and methods for determination of in situ stresses and pore pressure will be reviewed with particular focus on seismic methods.

Reservoir geomechanics. The development of stresses inside and outside a depleting reservoir will be explained, and consequences in terms of reservoir compaction, surface subsidence and time lapse seismic will be discussed with reference to field examples.

Borehole mechanics. The stress concentrations in the vicinity of a borehole will be explained, and some consequences for interpretation of well logs will be discussed. Conditions for stability during drilling and production will be presented. Essential data for prediction of stability problems, and methods for estimation of such parameters will be reviewed.

Fracturing & fracture propagation. Fracturing is an important method for productivity enhancement, especially in tight formations. The method will be described, and challenges related to planning and monitoring of fracture propagation will be discussed.

Beyond elementary rock physics. The combination of rock physics and geomechanics is complicated by several effects, such as dispersion, anisotropy and non-trivial relations between static and dynamic properties. These effects are particularly important for the link between field observations and laboratory tests. Challenges related to these effects, and possible solutions, will be discussed.

The students will be given copies of the presentations as handouts at the beginning of the course. The textbook "Petroleum Related Rock Mechanics. 2nd Edition" (Fjær et al., 2008) is recommended as a reference as well as for further reading.