



Kommende arrangementer

18. september

DGF Grundvandsmøde 2003: Prækvartære grundvandsmagasiner. Læs mere side 3.

25. september

DGF oliegeologisk foredragsrække:

Peter Scholle: Fluid composition and pressure history studies in chalk, Skjold Field, Danish North Sea.
Læs mere side 4.

4. oktober

Kvartærgeologisk ekskursion til Møn. Læs mere side 5.

medio oktober

DGF oliegeologisk foredragsrække:

Helge Løseth: Gas chimneys – indicators of a fractured cap rock
Læs mere side 5. Præcis dato følger senere – hold dig derfor orienteret på www.2dgm.dk

28. oktober

DGF temamøde kl. 15.00 - 19.00 med efterfølgende reception.

Finn Surlyk & Jon Ineson (conveners): The Jurassic of Denmark and Greenland.

Datoen kan ændre sig og program følger senere – hold dig derfor orienteret på www.2dgm.dk

20. november

DGF oliegeologisk foredragsrække:

Sadoon Morad: Diagenesis of deep, anomalously porous sandstone reservoirs. Læs mere side 5.

3. december

DGF oliegeologisk foredragsrække:

Aage Bach Sørensen: Cenozoic basin development and Petroleum exploration possibilities of the Faroes area.
Læs mere side 6.

Vindere af præmierne for hurtig betaling af medlemskontingent

De heldige vindere af **Jorden set fra Himlen** blev:

Morten Kræll Breiner, Majsmarken 96, 8520 Lystrup for lynhurtig betaling af kontingent.

Præmien for tilmelding til PBS vil blive offentliggjort så snart vi har fået meddelelse om hvem der har tilmeldt sig fra PBS.

Bestyrelsen siger tillykke til Morten.

Danmarks Geologipris 2003

Dansk Geologisk Forenings bestyrelse indkalder hermed forslag til kandidater til Danmarks Geologipris. Begrundede forslag skal være bestyrelsen i hænde senest **tirsdag d. 30. september 2003**.

Prisen tildeles en person eller gruppe af personer, som indenfor de seneste 5 år har publiceret én eller flere afhandlinger eller kort, som i særlig grad har bidraget til forståelsen af Danmarks eller Grønlands geologi.

Prismodtageren eller prismodtagerne skal endvidere være eller have været ansat ved en offentlig institution eller privat virksomhed i Danmark eller Grønland.

Læs mere om Danmarks Geologipris på DGF's hjemmeside: www.2dgf.dk.

DGF's oliegeologiske foredrag

DGF starter sin anden sæson med oliegeologiske foredrag. I lighed med sidste år arbejder vi på at få en attraktiv blanding af både generelle, metodeprægede foredrag og mere specifikke "case story" foredrag, præsenteret af både danske og udenlandske foredragsholdere. Sidste sæson oplevede vi en positiv interesse for de oliegeologiske foredrag, hvor der ofte deltog mere end 50-60 personer, og det et naturligvis vores ambition at fastholde denne interesse. Vi håber at vi med efterårets planlagte program, der har fokus på kalk- og sandstensdiagenese, seismisk sporing af væskebevægelser i undergrunden og petroleum systemerne omkring Færøerne, kan få mange til at møde frem.

Nyt fra Nationalkomiteen

Samarbejde med Danmarks Naturfredningsforening

Medlemmer af Nationalkomiteen og Styregruppen for Formidling har i marts deltaget i et møde med Naturfredningsforeningens naturfaglige udvalg for at diskutere et fremtidigt samarbejde om bl.a. beskyttelse af de nationale geologiske interesseområder, bevarelse af geologiske profiler samt formidling. Mødet forløb meget positivt. Det naturfaglige udvalg vil indstille til foreningens forretningsudvalg, at samarbejdet formaliseres. Henvendelse Niels Hald, Geologisk Museum, København.

Nationalparker

Miljøministeren har igangsat pilotprojekter for henholdsvis Møn, Mols og Lille Vildmose. Nationalkomiteen har skrevet til formændene for styregrupperne og foreslået, at der tilknyttes geologer med lokalkendskab til projekterne. Henvendelse Niels Hald, Geologisk Museum, København.

Danmarks Geologi på internettet

Komiteens projekt "Danmarks Geologi på Internettet" er ved at være afsluttet og har nu mere end 60 lokaliteter på www.naturnet.dk. Henvendelse Lise Holm, Skov- og Naturstyrelsen.

Geologi.dk

Nationalkomiteens hjemmeside og geoportal, www.geologi.dk, er takket være sponsorstøtte opdateret med danske netsteder og vil i efteråret blive udvidet med væsentlige internationale adresser. Som en særlig nyudvikling er et underemne om olie og gas ved at være klar til lancering. Vi modtager gerne ros og ris samt forslag til nye link. Henvendelse Erik Nygaard, GEUS.

Grundvandsmøde - torsdag den 18. september 2003 Prækvartære grundvandsmagasiner

Heldagsmøde i Torvehallerne, Vejle

Foreløbigt program:

10.00 **Indskrivning (the og kaffe)**

10.15 **Miocæne grundvandsmagasiner i Jylland**

Sedimentologiske og stratigrafiske undersøgelser af de miocæne aflejringsystemer
Erik Skovbjerg Rasmussen (GEUS)

Billund deltaet, et nyopdaget grundvandsmagasin i Midtjylland
Jørgen Fjeldsø Christensen (Ribe Amt)

Kortlægning af basis Miocæn og Odderup Formationen i Jylland (poster)
Niels Skytte Christensen (Geol. Inst. KU)

12.00 **Frokost**

13.00 **Kalkmagasiner på Sjælland og i Nordjylland**

Kalkmagasiner i Østdanmark set med geofysiske metoder
Thomas Vangkilde (Rambøll)

Kortlægning af fersk-saltvandsgrænsen i kalkmagasinerne på Sjælland
Kurt Klitten (GEUS)

Simulering af udvikling af fersk-saltvandsgrænsen i kalkmagasinerne på Sjælland
Flemming Larsen (DTU)

14.45 **Kaffe/thepause**

15.15 Grundvandsstrømning, saltvandsgrænse m.v. i kalkmagasiner – eksempler fra det nordlige Jylland
Karsten Juul (Dansk GeoFysik)

Grønsandskalken i Vestsjælland
NN

16.30 **Afslutning**

Praktiske oplysninger

Mødested: Torvehallerne, Kirketorvet 10-16, 7100 Vejle (lige ved stationen)

Pris: DGF-medlemmer 600 kr, studentermedlemmer 400 kr, andre 800 kr.
Prisen inkluderer frokost (uden drikkevarer) og kaffe/the

Tilmelding: Flemming Jørgensen, Vejle Amt, Teknik og Miljø, Damhaven 12, 7100 Vejle,
e-mail: fj@vejleamt.dk, tlf: 7572 3144 lok. 5124
Husk navn, adresse, tlf.nr og evt. e-mail samt oplysning om evt DGF-medlemsskab.
Tilmelding er bindende. Girokort vil blive fremsendt.

Tilmeldingsfrist: 1. september 2003

Yderligere info: Flemming Jørgensen (se ovenfor) eller Henrik Olsen 4597 1129, heo@cowi.dk

Fluid composition and pressure history studies in chalk, Skjold Field, Danish North Sea

Peter Scholle

New Mexico Bureau of Geology and Mineral Resources, Socorro, New Mexico

torsdag den 25. september 2003, kl. 16.00
Geologisk Museum, Øster Voldgade 5-7

Because North Sea chalks are extremely fine grained and have low permeabilities, they typically require 25% or more porosity to be productive hydrocarbon reservoirs. Preservation of such substantial porosity in deeply buried chalks requires unusual conditions because chalks lose pore space rapidly as a result of chemical and physical compaction associated with overburden loading.

Overpressuring is particularly widespread in North Sea chalks as a consequence of rapid rates of sediment accumulation and low permeability of both the chalks and the overlying Tertiary section. Studies indicate that the overpressuring currently seen in many areas has existed for at least 10 million years, in some areas possibly in excess of 30-35 million years. Maintenance of substantial overpressures for such long periods of time is difficult, particularly in areas of substantial tectonic activity (e.g., along faults or on piercement salt domes). Partial or complete loss of overpressures at any stage after their initiation could lead to rapid porosity loss until overpressures were reestablished. Thus, understanding the history of regional and local pore-fluid pressure variations is an important factor in models used to predict porosity variations in chalks of the North Sea Basin.

Geochemical studies, especially fluid-inclusion investigations, of Cretaceous chalks of the Skjold Field in the Danish North Sea have provided insights on episodic variations in fluid compositions, and thus, by inference, into variations in fluid throughput and pore pressure history of that field. Successive generations of calcite cements in fractures from chalks on this salt dome structure show alternations between zones of water- and oil-filled fluid inclusions, sometimes with a corrosion zone between them. Those variations are interpreted to reflect at least two episodes of oil filling and overpressuring of the structure, followed by failure of the seal, with loss of overpressuring and oil charge. Following those pressure dissipation events, calcite cementation under aqueous conditions helped to heal the extensive fractures produced in the chalk. This allowed gradual repressurization and refilling of the structure with hydrocarbons.

Other lines of evidence that support the concept of repeated pressurization-depressurization and the movement of deep basin waters through the field include the presence of oil trapped in low porosity and permeability chalks, extensive alteration of carbon and oxygen isotopic ratios, anomalously high fluid inclusion temperatures, significant dolomite in some horizons, and the presence of celestite in fracture fills.

Kvartærgeologisk ekskursion til Møn lørdag den 4 .oktober

Ekskursionsleder Michael Houmark-Nielsen, Geologisk Inst. KU.
Minimum antal deltagere 20

DGF vil afholde kvartærgeologisk ekskursion til udvalgte profiler langs Hjælm Bugt på Møn Stratigrafi og istektoniske strukturer fra klinterne ved Klintholm Havn, Tøvelde og Hvideklint viser et komplekst hændelsesforløb siden Eem-mellemistiden der bla. omfatter sedimenter fra tidligere nedisninger i Mellem Weichsel, aflejringer fra en ældre baltisk issø med spor af den omgivende subarktiske vegetation, samt spor i form af till-sedimenter og dannelse af istektoniske kridtflager fra to større isfremstød i Sen Weichsel.

Mødested og -tid: Parkeringspladsen v. Øster Voldgade 10, hvorfra der vil være fælles afgang med bus kl 9.00 med mindre andet mødested aftales med Michael Houmark (michaelh@geo.geol.ku.dk). Forventet tilbagekomst kl. ca. 18:00. Husk egen madpakke og kaffe/the. Øl og vand sørger DGF for.

Pris for medlemmer af DGF (inkl ægtefæller) 150 kr, studentermedlemmer 100 kr, børn 50 kr.

Bindende tilmelding til Sekretariatet på dgf@geologi.com **senest d. 17. september.**

Gas chimneys – indicators of a fractured cap rock

Helge Løseth

Statoil forskningscenter, Stavanger

Midten af oktober - for endelig dato se www.2dgf.dk

Several years of research has led to a refined understanding of seismic anomalies related to hydrocarbon leakage processes. The aim of the talk is to present well and seismic data related to gas chimneys and to argue that a fractured cap rock model can explain the observations.

Wells drilled inside gas chimneys have higher pore fluid pressure, higher mud gas readings, higher mud gas wetness, more hydrocarbon shows, lower velocities and higher temperatures, than wells drilled outside gas chimneys.

Gas chimneys are observed in low-permeable cap rock shales. Fractures must exist here in order to explain the observed oil shows within the gas chimneys. Such fractures can also explain the other observations related to gas chimneys. Tectonic induced processes can create swarms of fractures, e.g., above salt or clay diapirs. High-pressure fluvials can hydro-fracture cap rocks. The observed gas chimneys in the North Sea exist above either tectonic induced structures or high pressure reservoirs. Seismic modelling shows that irregular, low-velocity distributed patches can create similar noise zones as those observed in gas chimneys on real seismic data. Fractures may distribute the gas into irregular patches within the cap rock.

If the proposed model, that gas chimney reflects a zone of fractures cap rock is correct it has several implications to the oil industry. E.g., gas chimneys should be interpreted as oil and gas migration pathways and the extent and location of the migration route can be mapped directly from seismic data.

Diagenesis of deep, anomalously porous sandstone reservoirs

Sadoon Morad

Department of Earth Sciences, Uppsala University, Uppsala Sweden

**torsdag den 20. november kl 16.00
Geologisk Museum, Øster Voldgade 5-7**

Diagenetic alterations in sandstones and their impact on reservoir-quality evolution pathways are controlled by a complex array of parameters, such as the detrital composition and texture of the sand, the flow rates and composition of fluids and the thermal-tectonic history of the basin. Generally, progressive increase in temperature and pressure during burial diagenesis of sandstones is accompanied by a general trend of decrease in reservoir quality (i.e., porosity and permeability). However, several basins worldwide are known to host deep (< 4 km) sandstone reservoirs that are characterized by anomalously high porosity and permeability. The purpose of the talk is to review, further explore and suggest pre-drilling, predictive tools of the major causes for the occurrence of such reservoirs. These causes include: (i) the presence of clay minerals and micro-quartz coats and rims around the framework quartz grains, which are known to prevent the precipitation of syntaxial quartz overgrowths, (ii) early emplacement of hydrocarbon, and consequent retardation of diagenetic reactions, (iii) secondary porosity due to the dissolution of intergranular cements and chemically unstable framework grains, and (iv) shallow development of overpressure, which retards progressive compactional loss of porosity and permeability.

Cenozoic basin development and petroleum exploration possibilities of the Faroes area

Aage Bach Sørensen

Geological Survey of Denmark and Greenland

**onsdag den 3. december kl. 16.00
Geologisk Museum, Øster Voldgade 5-7**

The talk reviews the geological development of the Faroes part of the NE Atlantic Margin in the Cenozoic Era. The Faroes area is located west of the post Caledonian rift basin system formed back in the Devonian after the collapse of the Caledonian mountains. Tectonic movements and plate reorganisations during several phases have strongly influenced sedimentation and erosion along the Caledonian front.

During the Cenozoic four main tectonic phases with uplift, non-deposition or erosion had a major influence on basin development and structural setting. Firstly the arrival of the Icelandic plume to the Faroes area caused a series of uplift phases, which are monitored in the Selandian–Early Ypresian sedimentary succession. Secondly, tectonic uplift in the Middle Eocene ended the period of almost continuous subsidence of the Judd Basin since the Danian. In the Middle and Late Eocene new depocentres formed in the northern part of the Faroe-Shetland Trough and in the Faroe Bank Basin. Thirdly, due to uplift and sea level fall in the Late Oligocene, widespread erosion of the Eocene and Oligocene successions resulted in a major unconformity on the shelf. Finally in Neogene times folding and uplift of the Fugloy Ridge occurred contemporaneously with renewed subsidence in the northern part of the Faroe-Shetland Trough and the Faroe Bank Basin.

The first small petroleum discoveries in the Faroe–Shetland Channel were made in Mesozoic reservoirs. About 100 structures were drilled but no major discoveries were done. In 1990 the Foinaven Field was discovered, by occasion, in Paleocene sandstone, which together with Kimmeridgian source rocks form basis for the petroleum system in the southwestern part of the Faroe-Shetland Channel. Good reservoir sequences occur in settings where sedimentary entry points were located. The area was strongly influenced by inversion in Middle Eocene to recent time and reservoirs and source rocks were uplifted up to 600 m with gas flushing, seal breakage and interruption in petroleum generation as consequences.

Petroleum systems are also believed to exist in the northern part of the Faroe-Shetland Channel and in the Faroe Bank Basin.