

# PETROLEUM GEOLOGISCHE KRING



## KONINKLIJK NEDERLANDS GEOLOGISCH MIJNBOUWKUNDIG GENOOTSCHAP **PGK**

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<b>Venue:</b>	PGK's monthly meetings are held at the KIVI building, Prinsessegracht 23, Den Haag. Drinks are served from 17:00 hrs; the lecture starts at 18:00hrs.		<a href="http://www.pgknet.nl">www.pgknet.nl</a>
<b>Membership:</b>	Apply for membership by contacting the secretariat. The annual fee is €15.-		
<b>Accounts:</b>	Fortis Bank: 88.65.82.733 (PGK, Den Haag)		

## SEPTEMBER 2010 NEWSLETTER

### **15<sup>st</sup> of SEPTEMBER:**

The next PGK meeting will be on **Wednesday, September, the 15<sup>th</sup>, 2010.**

17:00-18:00 hrs: Social hour  
18:00-19:00 hrs: Lecture by:  
Bram van der Kooij (Shell International E&P)

on

**Cabralis, Carbonate Platform Margins & Carboniferous Oceans**  
- Palaeoceanography and Diagenesis of Carbonate Margins -

*Abstract on separate page*

### **OCTOBER PGK MEETING:**

The October meeting takes place on **Wednesday, 20<sup>th</sup> of October 2010.** Lecture by Timme Donders (TNO) on "Climate Change Trough Geological Time: From Snowball Earth to Polar Palmtrees"

### **NEW MEMBERS**

Applications for membership have been received from Leslie Kramers (TNO), Bertil van Os (Ministerie van Onderwijs, Cultuur en Wetenschap), David Bréthaut, Gulnazira Kunakbayeva (TNO), Toke van den Hemel (University of Utrecht), Yvonne Schavemaker (TNO), Stijn Bos (Argo Geological Consultants), Andrea Gootjes (Argo Geological Consultants), Dick Stegers (TNO-AGE), Femke Saulus (Fugro Engineers B.V.), and Rader Abdul Fattah (TNO). If no objections are received prior to or during the next meeting, they will be admitted as member of our society.

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## PGK EXCURSION: 14-17 OCTOBER 2010 DENMARK

We are happy to inform you that our October excursion is fully booked. However, in case you are still interested to participate you can register on a waiting list by sending an e-mail to our PGK excursion coordinator Henk Kombrink: [henk.kombrink@tno.nl](mailto:henk.kombrink@tno.nl)

We would also like to thank the co-sponsors of the excursion:



### **Upper Oligocene to Lower Miocene Eridanos delta sediments in Denmark**

The Upper Oligocene to Lower Miocene succession that crops out in the Lillebælt and Vejle Fjord area, east Jylland, shows exceptionally detailed sedimentary structures and demonstrates clear facies changes within a shallow marine and back barrier depositional environment. In addition, high quality seismic data from the same area illustrates the development of a wave-dominated delta and how to predict thick reservoir sands. The major surfaces and boundaries can be correlated into the North Sea Basin and thereby form a perfect analogue for the study of reservoirs encountered in the North Sea Basin.

The Upper Oligocene – Lower Miocene succession in Denmark is of interest to exploration geologists, to those working with seismic data, log-correlation and detailed sedimentology, and to reservoir geologists.

Why attend the excursion to east Jylland?

- Opportunity to study reservoir-analogues for the shallow gasfields in the northern Netherlands offshore area
- Reservoir prediction in wave-dominated deltas
- Principles of classic sequence stratigraphy
- Prediction of porous reservoir rocks
- Timing and tilting of the North Sea Basin - burial history and migration of hydrocarbons

Our excursion-leader will be Dr. Erik Rasmussen from the Danish Geological Survey (GEUS). He has >20 years experience in the area; especially regarding the Cenozoic delta system and published many papers on the subject. He will emphasize the link between the outcrops and subsurface data. Frans Bianchi will drive a comfortable bus.

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**Monthly meeting:** Wednesday 15<sup>th</sup> of September 2010  
**Address:** KIVI Building, Prinsessegracht 23, Den Haag

**Social hour:** Between 17:00 and 18:00 hrs  
**Lecture:** 18:00-19:00

## CABRALIS, CARBONATE PLATFORM MARGINS & CARBONIFEROUS OCEANS Palaeoceanography and Diagenesis of Carbonate Margins

Bram van der Kooij.  
Shell International E & P. – Den Haag, The Netherlands; bram.vanderkooij@gmail.com

Carbonate platforms are amongst the most versatile sedimentary bodies in system earth. They capture elements of the physical and chemical environment both during and after accumulation, and they preserve characteristics the macro and micro biological world. From a commercial and economic perspective, carbonate platforms hold 60% of the world's hydrocarbons and large fresh-water aquifers. The sedimentology and stratigraphy in carbonate platforms have been studied extensively for over 100 years. Early marine diagenesis, the role of variable conditions in seawater and subsequent burial diagenetic processes have, although documented for several decades, received much less attention.

Outcrops of Bashkirian to Moscovian (Carboniferous) carbonate platforms in Northwestern Spain provide an excellent case setting to study the interaction between carbonates and palaeo seawater in a process orientated manner, and burial diagenesis of carbonates. The focus of this study is on the lateral variability within the margin and slope domains. Large volumes of early marine cements are observed at palaeo waterdepths ranging from platform break to several hundreds of metres. Based on petrography, stable isotope geochemistry and element concentration analysis, it is tentatively concluded that palaeo-seawater circulation in an extensive, near-seafloor pore system is a first order control of carbonate ion supply and marine cementation. Coastal upwelling and internal or tidal currents are the most probable mechanisms driving pore water circulation at these depths. Carbonate cements precipitated under conditions of normal to elevated alkalinity, locally elevated nutrient levels and variable seawater temperatures.

Within a diagenetic context, these Spanish outcrops present a complex sequence of diagenetic events including both porosity enhancing and destructing features. In general, the marine and early-burial diagenetic cements were key contributors to the occlusion of the primary pore system. The remaining porosity is secondary in origin and predominantly includes fracture and mouldic porosity. The distribution of marine diagenetic features is characterised by a correlation with either water depth and/or lithofacies type. Early and late burial diagenetic features are present throughout the slope and show no correlation with lithofacies or paleo-water depth. These results are of significance because diagenetic processes have major implications for the interpretation of petrographic observations and particularly so for geochemical analyses. Furthermore, diagenesis proves to be a main control on the porosity volume and distribution in the slope domain. These observations are of importance since the Spanish carbonate margins are furthermore considered good outcrop analogues for the giant hydrocarbon fields in the Pricaspian Basin in Kazakhstan. This study is part of my PhD research which was a Euromargins project, sponsored by the European Science Foundation (ESF). Additional funding was provided by Shell International E&P.

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