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EUROPEAN ASSOCIATION OF GEOSCIENTISTS & ENGINEERS

Student Lecture
Tour Europe
2012-2013

ΤΜΗΜΑ ΓΕΩΛΟΓΙΑΣ ΑΠΘ

Το **Τμήμα Γεωλογίας**
του Αριστοτελείου Πανεπιστημίου Θεσσαλονίκης
και η **European Association of Geoscientists and Engineers**
διοργανώνουν Ημερίδα με θέμα:

Basin and Petroleum Systems Modelling

Χαιρετισμοί

Καθηγητής Α. Γεωργακόπουλος:
"Οι εξελίξεις στην έρευνα υδρογονανθράκων στην Ελλάδα"

Καθηγητές Γ. Τσόκας και Α. Βαφείδης:
"Εφαρμογή των Γεωφυσικών Μεθόδων στο στάδιο της αναζήτησης υδρογονανθράκων"

Dr Bjorn Wygrala:
"Technology and Applications for Petroleum Exploration Risk and Resource Assessments"

Τρίτη 26 Μαρτίου 2013, 12^{30}-17^{30}
Τελλόγλειο Ίδρυμα, Αίθουσα Διαλέξεων

Προεγγραφές: Λέκτορας Β. Μέλφος, 2ος όρ. ΦΜΣ, ΑΠΘ

Καθημερινά 9.00-14.00
Τηλ. 2310 99 8539
e-mail: melfosv@geo.auth.gr
Εγγραφές: 12.00-12.30 την ημέρα της Ημερίδας.
Η παρακολούθηση είναι δωρεάν.
Δίνεται βεβαίωση συμμετοχής.
Ενημέρωση: http://www.eage.org/students/index.php?evp=5748

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Basin and Petroleum Systems Modeling: Technology and Applications for Petroleum Exploration Risk and Resource Assessments

The stage will be set for the lecture with general information about petroleum exploration and production (E&P) and how the industry operates. The main goal is to give the audience a feeling for issues that have to be addressed as well as the scale, costs and risks of the operations and of the investments and decisions that have to be made. Some widely used exploration concepts will be introduced, moving from basin to play to prospect and the role of uncertainties and the basic geological risk factors in exploration will be shown.

Basin and Petroleum Systems Modeling will then be introduced and defined, starting with the rationale for models and process modeling in the geosciences, and followed by an introduction to the data types, workflows and goals of typical applications. Rather than just showing these points in theory, a case study will be used in a live software presentation to illustrate all of these points. Audience participation and questions will be encouraged in order to ensure that the key issues are understood. This part will conclude with a summary of the roles of the various geoscientific disciplines and show that the technology is integrative and can only be successfully applied with a truly interdisciplinary approach.

In the next part, the technology itself will be introduced in more detail. What are the controlling parameters for the development of oil and gas resources, and how can these be simulated with geological process modeling in order to at first understand petroleum distributions and properties, and then to predict them. As petroleum generation is primarily a function of temperature and geologic time, thermal history modeling is the first step. As distributions of oil and gas and in particular their phase are controlled by temperatures and pressures, pressure history modeling is then introduced. This is followed by a review of the methods that are available to simulate the entire process of petroleum generation, expulsion, migration, accumulation and loss in petroleum systems and a discussion of special technical challenges such as geomechanics will conclude this part.

Applications of the technology will then be presented, ranging from frontier exploration in which large areas with only sparse data are screened, to petroleum resource assessments of yet-to-find oil and gas, to detailed assessments of exploration risks in structurally complex areas. A comparison of applications for conventional and unconventional oil and gas will conclude this section.

The lecture will conclude with some key references and recommended reading, as well as a review of academic and professional opportunities to show possible next steps that can be taken by the students to develop their careers.

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Dr. Bjorn P. Wygrala



Dr Bjorn P. Wygrala was born in 1952 in Melbourne, Australia and educated in Australia and Germany. He obtained his MSc and PhD in Geology at the University of Cologne in Germany. In 1989 he completed his PhD thesis in applied, computer-based exploration techniques in the Po Basin of Northern Italy where he worked on a joint project with Agip, the Italian state oil and gas company.

Dr Wygrala's professional career took off with 3 years of field experience in sedimentology and basin analysis for the minerals exploration industry in Central Australia. In the past quarter of a decade he gained experience in basin and petroleum systems analysis and the application of simulation technologies for exploration risk and resource assessments for petroleum E&P companies in more than 40 countries.

Dr Wygrala is currently employed as the PetroMod Business Development Manager at the Schlumberger Aachen Technology Center in Aachen, Germany. His scientific interests are applied petroleum systems modeling, quantifications and sensitivity analysis of geologic parameters and processes in petroleum exploration and supporting educational efforts in integrated analyses for petroleum exploration risk and resource assessments.