

2009 Honorary Lecturer — Europe

SCHEDULE

Date	Section Name	City/State/Country
25 Feb	Leeds, England	University of Leeds Geophysical Society
27 Feb	London, England	Imperial College London Geophysical Soc
11 Mar	Edinburgh, UK	Heriot-Watt Inst of Petro Engineering
13 Mar	Delft, Netherlands	Delft Univ of Tech Geophysical Soc
17 Mar	Aberdeen, UK	Petro Exploration Soc of Great Britain
18 Mar	Leicester, UK	Univ of Leicester Geophysical Society
20 Mar	Krakow, Poland	AGH U Sci & Tech Geoph Soc
23 Mar	Novosibirsk, Russia	Univ of Novosibirsk Geophysical Soc
25 Mar	Moscow, Russia	Russian State U Oil & Gas Geoph Soc
27 Mar	Kiev, Ukraine	Kiev University Geophysical Society
30 Mar	Uppsala, Sweden	Uppsala University
1 Apr	Bucharest, Romania	Univ of Bucharest Geophysical Soc
24 Apr	Trondheim, Norway	Norwegian U Sci & Tech Geoph St Soc
6-8 May	Bergen, Norway	Sound of Geology
11 May	Berlin, Germany	Geoph Soc of Freie Univ
13 May	Milan, Italy	Italian EAGE-SEG Section
15 May	Patras, Greece	Univ of Patras Geophysical Society
19 May	Barcelona, Spain	Univ of Barcelona Geophysical Soc
16 Jun	Tel Aviv, Israel	Tel Aviv University

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Honorary Lecturer - Europe

MIND THE GAP IN SEISMIC RESERVOIR PREDICTION:

*How Rock Physics Can
Bridge the Gap between
Qualitative Geology &
Quantitative Geophysics*

2009

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MIND THE GAP IN SEISMIC RESERVOIR PREDICTION:

How Rock Physics Can Bridge the Gap between Qualitative Geology & Quantitative Geophysics

Presented by

Per Avseth

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Abstract

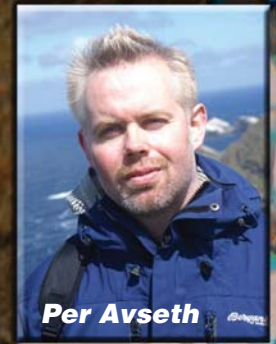
The field of rock physics represents the link between qualitative geologic parameters and quantitative geophysical measurements. Increasingly over the last decade, rock physics stands out as a key technology in petroleum geophysics, as it has become an integral part of quantitative seismic interpretation. Ultimately, the application of rock physics tools can reduce exploration risk and improve reservoir forecasting in the petroleum industry.

Traditionally, rock physics has focused on the understanding of how seismic signatures change as a function of hydrocarbon saturation, porosity, and pressure; with great breakthroughs made in laboratory experiments and theoretical modeling. Today, rock physics has extended its turf and plays an important role in the basin scale characterization of the subsurface, being an integral part of both well log and seismic data analysis. This lecture shows the importance and benefit of linking rock physics to geologic processes, including depositional and compactional trends. It further documents that lithology substitution can be as equally important as fluid substitution during seismic reservoir prediction. It is important in exploration and appraisal to extrapolate away from existing wells, taking into account how the depositional environment changes as well as burial depth trends. In this way rock physics can better constrain the geophysical inversion and classification problem in underexplored marginal fields, surrounding satellite areas, or in new frontiers.

The presentation includes practical examples and a North Sea case study to demonstrate a best-practice workflow, together with limitations and pitfalls, where rock physics models are combined with well log and prestack seismic data, sedimentologic information, inputs from basin modeling, and statistical techniques to predict reservoir geology and fluids from seismic amplitudes.

Biography

Per Avseth is a geophysical adviser at Odin Petroleum in Bergen, Norway, and a consultant to oil companies within the field of quantitative seismic interpretation and rock physics analysis. He is also an adjunct professor in applied geophysics at Norwegian University of Science and Technology (NTNU) in Trondheim, Norway. Per received his M.Sc. in Applied Petroleum Geosciences from NTNU in 1993, and his Ph.D. in geophysics from Stanford University, California, in 2000. His career includes one year at Norsk Hydro Exploration in Oslo, Norway, as seismic interpreter, and five years at Norsk Hydro Research Centre in Bergen as a research geophysicist. He has extensive worldwide experience in applying quantitative seismic interpretation methodologies in North and South America, Africa, and Europe. Per Avseth is the coauthor of the book *Quantitative Seismic Interpretation – Applying Rock Physics Tools to Reduce Interpretation Risk* (Cambridge University Press, 2005).



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