**Applications of ichnology in petroleum systems – an overview**

*Dirk Knaust*

Equinor ASA, 4035 Stavanger, Norway (dkna@equinor.com)

Ichnological studies have been complementing sedimentological analyses in the exploration and production of hydrocarbons for some decades. Initially used as tool for facies interpretations, more recently ichnology has been applied to evaluate reservoir quality, to predict and characterize source rock, to constrain stratigraphic correlations and to describe seal potential (e.g., unconformities) and analyse the overburden. Ichnofabric analysis has proven to be an invaluable tool in core description and the interpretation of depositional environments. For instance, a great potential is in the distinction of marginal-marine (i.e., brackish) environments from open-marine (i.e., euhaline) settings. The identification of intervals with lowered bottom-water oxygenation by means of bioturbation combined with other proxies can also aid in the identification of potential source-rock intervals. Likewise, various types of bounding surfaces can be identified and described by their trace-fossil content. Discontinuity surfaces, omission surfaces and unconformities are hiatal surfaces with importance for sequence-stratigraphic interpretations. Together with sedimentary, diagenetic and structural features, ichnological heterogeneities may have a positive or negative impact on reservoir quality and connectivity, depending on the kind of present burrows. Advanced tools such as micro-CT scanning, thin-sectioning, digitalization and small-scale modelling are effective in ichnological analyses.