# Developing reservoir presence probability mapping using stratigraphic forward modelling

*Supervisor(s): Peter Burgess, David Waltham*

## Project Description:

The chief aim of this project is to develop and apply a technique for subsurface petroleum system element prediction first described in Burgess et al. (2006) and more recently by Waltham et al. (2012). The technique uses multiple runs from stratigraphic forward models to quantify and predict the impact of multiple possible scenarios of accommodation, supply and sediment transport on reservoir and seal development, but the method remains under-developed, with much original development still possible to investigate the impact of different conditions in map formulation (e.g. different reservoir types, reservoir-seal combinations), different methods to accept or reject individual model runs according to their degree of fit to data, and the varying sensitivity of different model formulations in different depositional settings. The objective will be to develop the necessary theory, software, workflows and examples to allow more widespread application of this method in the E&P industry. This will be achieved by developing and applying the technique using a series of state-of-the-art stratigraphic forward models that span deep-marine siliciclastic (Waltham et al. 2008), carbonate (CarboCAT, Burgess (2013)), and multiscale terrestrial to deep-marine (model in development within the COMPASS research project, RHUL) depositional systems. Applications will be based on seismic and well data wherever possible. Deliverables from the project will include computer code to run and post-process multiple model scenarios to produce conditional frequency maps and example workflows showing how the method can be successfully applied in various subsurface evaluation scenarios.

## References:

Burgess, P.M., 2013, CarboCAT; a cellular automata model of heterogeneous carbonate strata, Computers & Geosciences, v. 53, p. 129-140.

Waltham, D., Jaffey, N., MacLean, S., and Zampetti, V., 2008,Stratigraphic modelling of turbidite prospects to reduce exploration risk, Petroleum Geoscience, v. 14, p. 273-280.

Waltham, D., Rowley, P.J., Burgess, P.M., and Maclean, S., 2012, Conditional frequency mapping of move reservoir sedimentation models for improved play assessment, European Association of Geoscientists & Engineers, Petroleum Play Assessment, Malaga, Spain.

## Research theme:

Extending the life of mature basins and exploitation in challenging environments

**Research context:**

Student will work within a rapidly growing quantitative dynamic stratigraphy research group within the geodynamics and sedimentary systems and physics and chemistry of earth processes research themes.

**Career routes**:

The student will develop expertise on stratigraphic forward model development and application applicable in specialist research, specialist service provider, exploration, and production geosciences areas within the oil and gas sector

**The closing date for applications is 23.59h on Thursday 20th February 2014**

*Details on how to apply can be found here* **www.rhul.ac.uk/studyhere/postgraduate/applying**
*Please contact the Postgraduate Programmes Co-ordinator, if you have additional questions about the department or application procedures (email:* **pgadmin@es.rhul.ac.uk** *; fax: 01784-471780; tel: 01784-443581).*
*Applicants are requested to send an additional copy of their CV directly to the lead supervisor of the project in which they are interested.  Please also contact the supervisor if you have any questions about the project itself*