# NERC Centre for Doctoral Training in Oil & Gas (2018 start)

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| **Project Title**: Automated Image Analysis for Rapid Biostratigraphic Data Collection |
| **Host institution: University of Birmingham** |
| **Supervisor 1: Dr Tom Dunkley Jones (UoB)** |
| **Supervisor 2: Dr Stephan Lautenschlager (UoB), Prof. Ales Leonardis (Computer Science, UoB)** |
| **Additional Supervisor: Dr Manuel Vieira, Stratigrapher, Specialist Geology Team, Shell UK** |

**Project description:** Calcareous nannofossil biostratigraphy is a key tool within the exploration and production process, providing robust high-resolution stratigraphic correlations across and between fields. Within drilling operations, real-time rig-site biostratigraphy can be essential for both geo-steering and geo-stopping activities. These operations currently rely on intensively analysing nannofossil content with standard light microscopy techniques. This studentship will build on recent developments in microscope and image capture automation, together with "smart" image processing and classification algorithms, to develop a new system for automated nannofossil assemblage data collection.
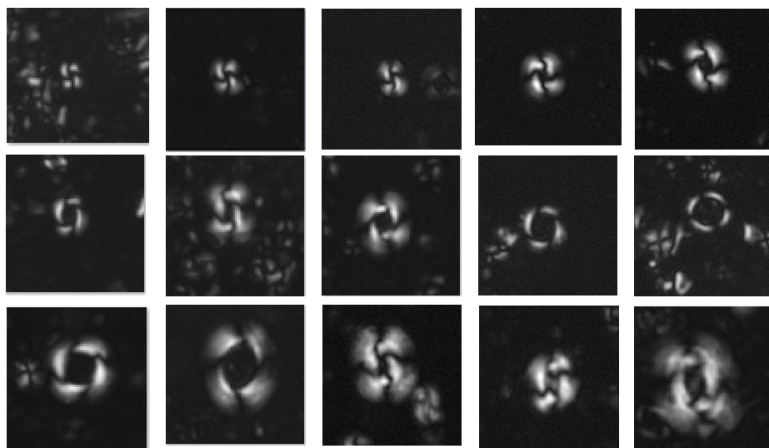


*Images of Reticulofenestrid coccoliths from the Browse Basin NW Australia (IODP Site U1482)*

This project will focus on high-throughput automated image capture using image-processing algorithms capable of high-skill in particle classification, identification and morphometric analysis. In the first instance the project will focus on a continuous sequence of mixed clastic and carbonate sediments, spanning the last 10 million years, recovered from the Browse Basin on the NW Australian shelf. These sediments yield excellent calcareous nannofossil recovery and preservation and already have good paleomagnetic and planktonic foraminiferal age control within which to situate the proposed new biostratigraphic study.

This project directly builds on the research of lead supervisor Dunkley Jones, who has ~15 years of experience in nannofossil biostratigraphy. The project will be supported by **Dr Stephan Lautenschlager** whose research focuses on the 3D digital imaging and restoration of vertebrates, and **Prof. Ales Leonardis**, an expert in computer vision with the School of Computer Sciences. We also work closely with project partner, **Dr Manuel Vieira**, who will provide direct guidance on industry-relevant applications, and make the link to Shell's existing experiments in remote, automated microscopy for rig-site applications.

**Applications:** To apply for this PhD, which is fully funded for 4-years within the NERC CDT in Oil and Gas, please submit an application via the link below by midnight **Friday 27th July 2018**:

https://sits.bham.ac.uk/lpages/LES002.htm

Choosing: PhD in Department of Earth Sciences - Full-time Research - 2018/19 -> "Apply Now". Please use the above text for the "project description" where required in the online application.

Please also email t.dunkleyjones@bham.ac.uk as soon as possible noting your intention to apply.

**Key skills:** candidates with experience in calcareous nannofossil micropaleontology, biostratigraphy and/or Python programming are especially welcomed.