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

Project Title: **Evolution of the West Africa Margin: seismic-stratigraphic study of the Mauritania-Senegal-Guinea Bissau Basin**

Host institution: University of Manchester
Supervisor 1: Prof Jonathan Redfern
Supervisor 2: Prof Mads Huuse
Additional Supervisor (s):

Project description:

The Central Atlantic is a poorly understood region and comprises some of the largest oil discoveries in the world in recent years. This PhD aims to evaluate the large scale evolution of a major rift to passive margin system and examine the controls on its tectonic and depositional evolution. Recent billion barrel oil discoveries on both sides of the conjugate margin suggest it has the potential to be a major future hydrocarbon province and improved understanding of the basin style and mechanisms are critical to reduce exploration risk and improve success.

This project aims to examine the tectono-stratigraphic evolution of the West African side of the Central Atlantic margin, from Mauritania through Senegal to Guinea-Buissau. The study will focus on refining our understanding basin evolution, and stratigraphic architecture, to develop new models for the palaeogeography, facies trends and igneous intrusion timing, distribution and styles across the margin. The work will integrate data a large regional 2D seismic grid with data from from existing wells (wireline log / biostratigraphy) and gravity / magnetic data.

Key areas for study include: interaction between slope and shelf areas and transform faults and igneous centres through time; the syn-rift to drift transition; mapping the evolution of the Jurassic carbonate platform and control it has on later sedimentation, internal facies of Cretaceous fans and shelfal systems; Cenozoic shelf-slope stratigraphy including canyons, mass transport deposits, gullies, sediment waves; igneous intrusions and extrusions.

The work will be linked to ongoing projects being undertaken by the North Africa Research Group (NARG)

Research context:
The principal results should be an enhanced understanding of passive margin evolution and controls on depositional style and fill. The project will aadress the influence of tectonics and basin evolution on sedimentation style through time. This will link with an ongoing source to sink and low-T geochronology studies onshore Mauritania and Senegal. This large basin is poorly understood and the generic outcomes are expected to yield models applicable to other passive margin basins.

Research costs/logistics: The project is fully funded through the CDT. The University of Manchester has world class seismic lab facilities. Seismic and well data provided by NOCs and seismic contractors.

Career routes: Exploration geophysicist in an oil company or a future career in academia