

From: Dorrik Stow <Dorrik.Stow@pet.hw.ac.uk>  
Sent: 07 February 2014 08:40  
To: chair@bsrg.org.uk  
Subject: Anastasia Polymeni HARWOOD application

Dear Chris

I am writing in support of the application made by Anastasia Polymeni to both the Harwood and Farrell funds, both as her supervisor and as Head of Institute.

I confirm that Anastasia is a full-time PhD student in Petroleum Geoscience in Institute of Petroleum Engineering, Heriot -Watt University. She has a fully-funded scholarship from our Department. She is an excellent and hard-working student whom I expect to flourish in her subsequent career. I am therefore very keen to give her every opportunity to grow, develop and learn during her PhD programme. She has exactly the right character to make the most of any such opportunities provided.

Her research is on an exciting topic, both scientifically in terms of plate interaction and its affects at the African-European junction and in terms of its current significance in the search for new hydrocarbon resources within the central and eastern Mediterranean regions. Her excellent seismic database does need careful calibration and understanding by examination of the onshore dataset in southern Sicily. This is the strong justification for her application to the Gill Harwood fund for field work. The region is, of course, complex and many different people and organisations have attempted to unravel different elements of the story. There is an excellent possibility for Anastasia to benefit from interaction with those who have undertaken such work and to set her own research objectives into the regional and exploration context. This would be by attending the conference in Naples, for which she has applied to the Steve Farrell fund.

The Department (IPE) is prepared to support these two trips allied to Anastasia's research by awarding our PGR fieldtrip fund (maximum £1000) and conference fund (maximum £500). Her applications are therefore to support the amount available from the Institution.

I appreciate that the award of both funds to one individual is probably unlikely. My preference would be to rank them in terms of the likely benefits to Anastasia and her research as: (1) the Gill Harwood Fund for the field work, and (2) the Steve Farrell fund for the conference.

With best regards

Dorrik

Professor Dorrik Stow  
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## 1. A brief CV emphasizing the academic qualifications back to first degree level.

**Name:** Anastasia Polymeni

### **Education:**

*Current Education:* PhD Student studying Petroleum Geoscience; PhD subject: The tectonostratigraphic evolution of Sicily Channel Rift Zone, Central Mediterranean at the Institute of Petroleum Engineering, Heriot Watt University, UK.

*Masters:* A one year MSc in Reservoir Evaluation and Management at the Institute of Petroleum Engineering, Heriot Watt University gave me further seismic, core logging and fieldwork experience.

*Undergraduate:* Completed between 2006 and 2011, at the Department of Geology in University of Patras, Greece. This course gave me a firm understanding of basic geology and fieldwork techniques.

### **Research:**

My research started in early 2013 during my PhD in Petroleum Geoscience in Institute of Petroleum Engineering (IPE) in Heriot-Watt University entitled: “**The tectonostratigraphic evolution of Sicily Channel Rift Zone, Central Mediterranean.**” The project is fully funded by the same department and supervised by Professor Dorrik Stow (IPE), Professor John Underhill (IPE) and Dr. Aaron Micallef (University of Malta). During the first year of my research, I completed the literature review considering the geological background, tectonic framework, stratigraphic profile and different proposed models for the evolution of the Central Mediterranean. There are no other sources of funding so I applied in both BSRG Awards, Steve Farrell and Gill Harwood Memorial funds, each of those for different purpose.

### **Skills and Training:**

- 1) Since autumn 2013, I have been conducting seismic interpretation under the supervision of Professor John Underhill. Key aims are to define the key horizons and build a preliminary model of tectonostratigraphic evolution of Central Mediterranean.
- 2) Meanwhile I was trained as a petrophysics laboratory tutor introducing MSc students of IPE in Techlog petrophysics software and interpretation.

### **Achievements to Date:**

Collaboration and data donation from exploration companies, Spectrum ASA and Shell. There is obligatory progress check every 6 months.

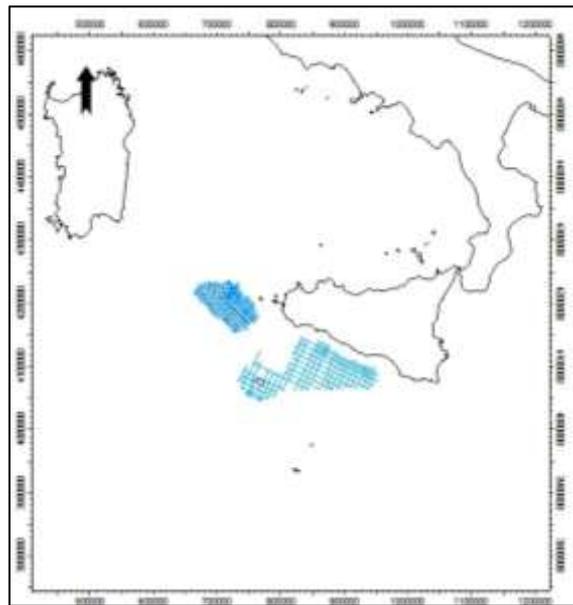
Building upon extensive literature review, one book and two papers are in press with myself as a co-author. These are outlined below;

- Stow, DAV., Polymeni, A., *In Press*. Petroleum Geology of the Red Sea. In: Rasul et al. [Eds.], The Red Sea, Springer-Verlagand. Presented by Professor Dorrik Stow in conference in Jeddah, 2013
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## 2. An outline of the present and proposed research.

### Key Research Questions:

The Central Mediterranean region has had a highly complex geological history. This is evident from the high number of earthquakes and volcanic activity observed in this region. This study focuses on the Pelagian block, located in the foreland of the Island of Sicily. It is a dominant structural feature of undeformed northern African continental crust and is made up of a sequence of Meso-Cenozoic carbonate and volcanic rocks. The Sicily Channel Rift Zone (SCRZ) governs the central area of the Pelagian block where the elongated, fault-bounded grabens of Pantelleria, Malta and Linosa exist. Those troughs started forming during Late Miocene and filled with turbiditic and hemipelagic sediments of Plio-Quaternary age. However, developing mechanisms of those passive rift grabens are still poorly understood.



These Miocene to recent graben sediment fills have great hydrocarbon potential and the seismic stratigraphic relationships within them hold clues to the recent geological history of this region. The complicated tectonic history of Central Mediterranean region resulted in the development of multiple possible scenarios of genesis with little unity of hypotheses in the literature. This is something this research hopes to clarify.

### Aims of Research:

The primary aim of the research is to develop a new accurate model for the evolution of the foreland region of Sicily in the Central Mediterranean considering the plate interaction and the catastrophic events which affected the relief of the region. Considering other analytically studied events, for instance the Gibraltar closure that resulted in the Messinian Salinity Crisis, restoration will be achieved. This will help to determine the age of the events. This is the first study in this region to integrate the different disciplines of Petroleum Geoscience, including sedimentology and basin analysis, seismic stratigraphy and interpretation, petrophysics and fieldwork.

Indication of the rock properties and their liquid content can be extracted from the well logs. Combination with the seismic images will provide confidence about the accuracy of the results. Together with the outcrop analogues basin analysis will be completed. This will allow a secondary aim to be fulfilled. That is to define the prospectivity of the region for hydrocarbon accumulations which is of great industrial interest.

**Importance of Research:**

This is the first study on this region to utilize seismic, sediment core and outcrop data to build a complete tectonostratigraphic model. It is a region of extremely complex geological history, and a good understanding of the study area on all scales is required to fully grasp the tectonostratigraphic evolution.

**Funding Usage and Importance:**

As emphasised above, a full understanding of the tectonostratigraphy of this complex region cannot be fully understood unless combined with outcrop analogues and well data. I therefore aim to use this funding to attend a fieldtrip in southern Sicily and the volcanic island of Pantelleria during summer 2014. Outcrop analysis is necessary for the study of the lithologies across the area, will provide me knowledge regarding the extent of the immobile Messinian Salt and help me correlate the features and structures related to the catastrophic events observed in seismic data and the potential hydrocarbon trapping mechanisms. Those specific areas were chosen as they lay closest to the dataset locations and will achieve to link the observed tectonic events in the seismic images to the outcrops and define the reason of their existence.

The project objectives comply with the BSRG Gill Harwood Memorial Fund as the fieldwork aims to the detection of the depositional processes and environments that affected the sediment as well as the tectonic control on the sediment supply and the geological mapping, sampling and characterisation of key lithostratigraphic units to achieve the reconstruction of the basin history.

The results gathered from the fieldwork combined with the existing offshore seismic data would improve the understanding of the character and evolution of the area and help the detection of possible hydrocarbon accumulations. This is an issue of great industrial interest, and will fulfil one of the key aims of this PhD research project.

My background and my current research make me dignified candidate for the Gill Harwood Memorial Fund and I hope that you will find my research topic and my intension to create a widely accepted model for the evolution of Central Mediterranean, of interest.

### **3. A breakdown of the budget**

The fieldtrip in Southern Sicily and Pantelleria Island will last two weeks. The Gill Harwood Award will be used for living and travelling expenses. The rest will be used for the transport in the outcrops of Sicily. The expected expenditure is outlined below:

Air Fare rtn Edinburgh-London: 130

Air Fare rtn London – Palermo: £300

Air Fare rtn Trapani – Pantelleria Island: £150

Car Hire for 15 days: £ 340

Accommodation for 15 nights in B&B: £ 800

**Total : £1720**

IPE fieldtrip set: £1000

**Total Use of Gill Harwood Fund: £720**

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**Funding Usage and Importance:**

It is prominent that while building the model of evolution, I have to be updated regarding new ideas and models developed. The conference entitled as: Mesozoic and Cenozoic carbonates of the Neo-Tethys: old and new concepts for petroleum exploration is organised by the American Association of Petroleum Geologists-Europe Office and consists a good opportunity to learn from the experts. The conference takes place in Naples, Italy in 25-26<sup>th</sup> March 2014 and includes a two post-conference fieldtrips; one-day fieldtrip on 27<sup>th</sup> March and two-day fieldtrip on 28-29<sup>th</sup> March visiting the Val d'Agri and Tempa Rossa onshore complex oilfields where reservoir is hosted by the Mesozoic and Cenozoic carbonate sequences.

Participation in the conference fieldtrip would provide a great first contact with the area of interest and important information from the experts regarding the complexity and geological history of the region. It will also provide guidance about the organisation of the fieldtrip related directly to the PhD project. Moreover, it will give the chance to meet and discuss with experienced geoscientists with interest related to the tectonostratigraphic framework of the Sicily-Channel Rift Zone as part of the evolution of the Central Mediterranean and get more advice on how to deal with its complexity.

My willingness is to improve and complete successfully this PhD project, acquire advanced level knowledge of the major disciplines of petroleum geology and develop a unique and generally accepted model. Finally, my intention to improve my communication skills and contact with experienced people from academia and industry, make me a remarkable candidate for the Steve Farrell Memorial Fund.

### **3. A breakdown of the budget**

The conference and fieldtrip attendance in Naples, Italy will last 5 days.

Accommodation cost for 5 nights: £375

Air Fare rtn London-Naples: £200

Conference attendance (student): £62

Two-day fieldtrip participation: £270

**Total: £907**

The cost will be totally self-funded. The maximum amount given from the Steve Farrell Memorial fund ranges between £250-300. This will be a great help for me and give me the chance to participate in the conference strongly related to my area of research.