

Methane seep ecosystem functioning - Opportunity for 3 year funded PhD



Deep sea methane seeps are complex environments, with environmental parameters changing over a range of temporal and spatial scales.

Jacobs University Bremen OceanLab have maintained tracked research vehicles ('Wally' crawlers - [doi:10.1016/j.mio.2013.07.001](https://doi.org/10.1016/j.mio.2013.07.001)) at a Barkley canyon pockmark (~890 m depth, Pacific Canada) over the last five years. These crawlers have been connected for power and data transfer to the Ocean Networks Canada (ONC) cabled infrastructure. The ecosystem is diverse and dynamic, comprising of an active methane hydrate mound, carbonate outcrops and surrounding soft sediments. Additionally, the Barkley canyon operates as a rapid conduit for organo-mineral aggregates to the deep sea, delivering periodic nutrient pulses to the seafloor communities. Some fauna present are tied closely to the methane seep activity (chemosynthetic clams, bacterial mats) whereas other fauna, though periodically abundant in densities higher than generally observed at comparable depths, are more opportunistic, or occasional visitors to the region. In addition to faunal community variability, the methane pockmark is also actively changing - vertically expanding in some regions, collapsing in others.

As part of the German nationally funded 'ROBotic Exploration of eXtreme environments' (ROBEX) project (<http://www.robex-allianz.de/en/>) Jacobs University offers a 3 year funded PhD project to a motivated candidate. The current generation of 'Wally' crawler are within the ROBEX project being updated with semi-autonomous navigation and pathfinding systems, as well as being mounted with both HD camera systems and environmental sensor packages. The PhD student will be responsible for using this evolving system to investigate the faunal community and environmental variability at the Barkley canyon pockmark site, whilst also assisting in the development of the technology and of novel data analysis techniques for the large amount of data being generated by the crawlers. The full title of the PhD title can be tailored to fit the candidate's interests, but should fully match the aims of the ROBEX project: The further development of the facility to use robotic platforms to explore extreme environments. The PhD will be co-supervised by scientists from the Alfred Wegener Institute (AWI) and other ROBEX partner institutes.

REQUIRED PREREQUISITES:

Degree in Oceanography, biological oceanography, marine geosciences or related discipline
Good computer literacy and experience in handling large data set
Fluent in English (written and oral)

DESIRED PREREQUISITES:

Experience with computer programming, image analysis, or advanced statistical tests
Knowledge of methane seep environments

APPLICATION DEADLINE:

This PhD project is available as of 1st May 2015 and will remain open until filled by a suitable candidate.

APPLICATION PROCEDURE:

Please send a recent CV and one-page project outline to Professor Laurenz Thomsen (L.thomsen@jacobs-university.de) and Dr Autun Purser (a.purser@jacobs-university.de) for consideration.

For more information on the possibilities for the PhD project you are welcome to contact them.