

## **Assessing the Applicability of Biological Trait Analysis (BTA) in Deciphering the Ecological Functioning of Microfossil Communities Across the PETM**

**Celestine N. Nwojiji<sup>1</sup>, Fabienne Marret<sup>1</sup>**

<sup>1</sup>School of Environmental Sciences, University of Liverpool, Liverpool, Merseyside, United Kingdom.

### **ABSTRACT**

The motivation of this study is to understand how the traits and biogeochemical changes in foraminifera affected their ecosystem functioning during the Late Palaeocene - Early Eocene extreme climate events. We are using biostratigraphy and other paleoecological proxies as well as biological trait analysis (a tool that allows the relative importance of different planktonic traits to be quantified) to study the feedbacks on the microfossil communities during this very important climatic event. The materials for this investigation was supplied by Ocean Drilling Program (IODP) cores from Leg 199 Site 1215 and Leg 208 Site 1265 in the central Atlantic and Pacific Ocean. The preliminary result from Site 1215A indicate that the foraminiferal assemblages in the Pacific Ocean are dominated by benthonic (infaunal) communities and few planktonic species which showed high level of weathering during the PETM. This implies that there was an increase in bottom water nutrient (organic carbon) supply. The high level of dissolution shown by the recovered foraminifera indicated that the sediment was deposited within / above the lysocline. Some important taxa identified include; *Nuttallites truempyi*, *Nonion havanese*, *Tappanina selmensis*, *Globoturborotalia brassriverensis*, *Bulimina* spp, *Subbotina patagonica*, *Cibicidoides* spp. and *Globorotalites micheliniana*. The high abundance of *Buliminids* and *Nuttalides* species indicates low oxygen concentration in the ocean floor and oligotrophic condition during the event. This ocean anoxia could be responsible for the total absence of dinoflagellate cysts in all the cores studied. Eight foraminifera traits to be analysed for BTA include; test composition, shape, chamber forms, ornamentation, living habit, aperture, sizes, and feeding habits.