

# IMOS PhD Student Profile

This is the first of several articles about students using IMOS data for their PhD research

## Joana Cubillos

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Joana's PhD project aims to study changes in the calcification of Coccolithophorids through time, using fossil records and current sediment trap samples. Her project will improve our understanding of past coccolithophorid assemblages in the Southern Ocean and their response to various environmental conditions. With the current trend in ocean acidification, changes in nanoplankton assemblages and distribution in the Southern Ocean are expected. There is already evidence of a shift South in the distribution of the coccolithophorid *Emiliana huxleyi*, (Cubillos *et al.* 2007) and implications of these changes are yet to be understood.

Joana hopes that the fossil record could provide an insight into changes

**Project Title:** *Coccolithophores assemblages from the Last glacial Maximum to Holocene and calcification patterns in relation to current and future oceanographic processes*

in calcification throughout the Holocene, and possibly whether the amount of calcite in coccoliths has undergone any change throughout the industrial era. For this, Joana will study the Coccolithophorid *Calcidiscus leptoporus*, using morphometric analysis and weight estimate by birefringence. The fossil record will be compared with sediment trap samples from the IMOS facility Southern Ocean Automated Time Series Observations (SOTS), in order to evaluate levels of dissolution of the core and also reveal any connection between past assemblage patterns and seasonality. She will also use the sediment trap samples to study the response of calcite intake of *Calcidiscus leptoporus* to seasonality.



Scanning Electron Microscope photo of *Emiliana huxleyi*, a calcareous nanoplankton species found in the Southern Ocean.



Joana Cubillos at the French base Dumont d'Urville in Antarctica during field work for her study of *Emiliana huxleyi*.

### For more information:

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Cubillos JC, Wright SW, Nash G, de Salas MF, Griffiths B, Tilbrook B, Poisson A and Hallegraeff GM (2007) Calcification morphotypes of the coccolithophorid *Emiliana huxleyi* in the Southern Ocean: changes in 2001 to 2006 compared to historical data. *Marine Ecology Progress Series*, 348, pp. 47-54.