

Laboratory : **Biogéosciences** UMR CNRS 6282; team **BioME**

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**Subject** :

**Role of biotic interactions in the structure of marine biodiversity at broad spatial scale. The Antarctic echinoid case study.**

**Abstract:** Marine biodiversity is not evenly distributed on Earth. At broad spatial scale, species distribution is controlled by both environmental conditions, abiotic and biotic, and regional idiosyncrasies. The role played by biotic interactions in species distribution is a hot topic as predictions of the effects of climate change on biodiversity should take biotic interactions into account and not just be based on the expected evolution of its abiotic drivers. Marine areas and polar seas in particular have been little studied in macroecology, while polar ecosystems are already being impacted by current climate change. Based on our knowledge of the relationships between species distribution and its main abiotic drivers (niche modelling approach), *the present project aims to appraise the contribution of biotic interactions to biogeographic patterns displayed by Antarctic benthic biodiversity, through the example of echinoids*. More precisely, the project will focus on the role played by between-species competition within two echinoid families: the Echinidae and Schizasteridae. When significant, the role played by competition will be integrated into distribution models as maps of competitive constraints. The present project will benefit from the results of a previous work based on abiotic-only data. It will mostly consist in data mining using an existing large dataset that includes distribution data and maps of abiotic variables. Protocols using GIS tools (ArcGIS) and describing ecological niche modelling procedures (Maxent, GARP) already exist and will be followed.

**Candidate skills:** the candidate must have good knowledge of ecology (especially of marine ecology and/or biotic interactions) and familiarity with concepts of ecological niche, macroecology, and biogeography. He, she should be able to quickly master GIS tools (ArcGIS or QGIS) and use programs of ecological niche modelling such as Maxent, GARP, ENFA or MARS. Programming skills with R are also appreciated.