Ecole Doctorale des Sciences Fondamentales

Title of the thesis: Marine mircoorganisms as a source of nanoparticle sin the atmosphere

Supervisor : Karine Sellegri
Laboratory : LaMP
University : UCA
Email and Phone : K.Sellegri@opgc.cnrs.fr; 0033 473407394
Possible co-supervisor : Clémence Rose
Laboratory : LaMP
University : UCA

Summary :
Aerosol particles are ubiquitous in the atmosphere. They are important from a climatic point of view because they interfere with solar and terrestrial radiation, and in the formation of clouds. In the marine atmosphere, particles can be emitted to the atmosphere as sea spray, or by the formation of new nanometric particles from gaseous precursors emitted by the oceans. On the basis of the results of recent oceanographic campaigns carried out in the Mediterranean and in the South Pacific Ocean, we have shown that the microorganisms living in the oceans are essential in modulating the fluxes and properties of these marine particles, in particular their cloud condensation nuclei properties. The challenge for research in the coming years is to identify the chemical precursors of nanoparticles formed from marine emissions of biological origin, from an experimental point of view, but also to integrate these new species and their nucleation process into a meso-scale model. The candidate will participate in field campaigns in the Southern Ocean using advanced mass spectrometry tools, and insert these new measurements into the model, in connection with their oceanic sources. It is a multidisciplinary thesis associated with the fields of marine biogeochemistry and atmospheric sciences.