



PhD Thesis offer

Development of stretched and recyclable multilayered films for food packaging

Context and objective

In a context of reducing the impact of plastics on the environment, it is essential to intensify actions in favor of **a more circular economy for plastic food packaging**, in particular by developing new recyclable films or using biobased polymers. In this perspective, the PSPC "Stretch" program aims at developing **high-performance multilayer films** that meet these expectations.

The objective of this thesis is therefore to implement **petroleum-based/recyclable and biosourced/biodegradable multilayer films** with improved barrier, thermal and mechanical properties. The developed strategy consists in combining a **nanolayer coextrusion** process with a (biaxial) **stretching step** using innovative formulations. The nanostratification induced by the multilayer coextrusion process and the stretching will induce a modification of the film microstructure (degree of crystallinity, crystal size and orientation, molecular orientation in amorphous phase, orientation of possible fillers). Fine characterization methods will be used to study this **nanostructuration** and its **impact on the macroscopic properties**.

Presentation of the hosting research unit and working environment

This thesis is part of the PSPC "Stretch" program with a consortium composed of 6 partners, including 3 companies, an industrial technical center and two academic research laboratories. The thesis will take place at the **PIMM laboratory** (<https://pimm.artsetmetiers.fr/>), located at ENSAM (151, Bd de l'Hôpital - Paris XIII^e), which is a joint research unit of ENSAM, CNRS, CNAM. This full-time position is offered on a fixed-term 36 months contract and the net monthly salary is around 2000 €.

Skills and experience

Physicist or chemical physicist, the candidate must have a Master degree (or graduate from an engineering school) in Materials Science and have a good knowledge of polymers. Experience in polymer processing would be appreciated. A good knowledge of English (written and spoken) is essential.

Key-words

Polymers, nanolayer coextrusion, stretching-induced orientation, gas barrier properties, crystallisation under confinement.

Application

You can apply for this thesis offer until April 30, 2021 by sending a Curriculum Vitae, a cover letter, letters of recommendation and your scores obtained in the master and/or engineering degree to Matthieu Gervais (matthieu.gervais@lecnam.net), Alain Guinault (alain.guinault@lecnam.net) and/or Cyrille Sollogoub (cyrille.sollogoub@lecnam.net).