

## **3 years PhD position**

- *Centre for Materials Forming (CEMEF) of Mines ParisTech, Sophia Antipolis, France*
- *Center for Research in Process Engineering of Divided Solids, Energy and Environment of IMT Mines Albi (RAPSODEE), Albi-Carmaux, France*
- *Centre of Thermodynamics of Processes (CTP) of Mines ParisTech, Fontainebleau, France*

## **Textiles recycling: making new high-added value materials**

### Project description

Due to the growth of population, the demand for textile products is increasing, leading, as a consequence, to the increase of their waste. Currently, most of textile waste is either incinerated or landfilled. Modern textiles are multicomponent materials making their recycling challenging. Innovative solutions are needed to help building circular economy

The goal of this work is to make new high-added value materials from waste textiles based on mixed natural (cotton, wool) and synthetic (polyester) components. The components will be separated and new high-added value porous materials, bio-aerogels, will be made.

The work is at the frontier of polymer chemical physics and materials' processing. It will involve the use of various techniques, including formulation, rheology, optical and electron microscopies, characterisation of solutions, blends and porous materials, and the understanding of thermodynamics of mixed solvents for cellulose and wool dissolution.

The experimental work will be performed in CEMEF (2/3) and in RAPSODEE (1/3) laboratories in close collaboration with CTP in what concerns theoretical thermodynamics. CEMEF is world leader in the development of biomass-based materials, in particular, in bio-aerogels. RAPSODEE is expert in shaping and characterization of divided solids/powders and CTP is a recognized expert in thermophysical properties and phase diagram determination, especially in solvent screening.

Keywords: solutions, blends, fluid thermodynamics, rheology, bio-aerogels, particles.

Skills: knowledge in polymer chemical physics, capability to work in group, fluent in English, mobility, motivation and sense of initiative and capability to report regularly on his/her work.

Duration: 3 years

Gross annual salary: about 26 k€/year.

The position is available from October 2020.

### Application:

The position is for a student with Master degree.

Please send your CV, motivation letter, your marks from the last two years and two emails of a reference person to Tatiana Budtova, CEMEF, email : [tatiana.budtova@mines-paristech.fr](mailto:tatiana.budtova@mines-paristech.fr)

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