



## **6-month trainee position**

*Centre for Materials Forming (CEMEF) of MINES ParisTech  
Sophia-Antipolis, France*

**Project title: « Cellulose aerogel beads » (acronym: « AEROBEADS »)**

in the frame of European project “Nanohybrids”



### **Project description**

The overall goal of Nanohybrids project is to develop a new generation of nanoporous organic and hybrid ultra-light materials, aerogels, with multiple functions for applications in gas and humidity adsorption, personal care and food. Aerogels will have to be in the form of particles of various shapes and sizes. The purpose is to insure high porosity and controlled pore size distribution in order to provide high pore surface area and pore volume coupled with particle controlled shape and size.

The part of Nanohybrids project performed in CEMEF laboratories will concern the preparation and characterisation of cellulose aerogels in the form of beads.

### **Objectives and scope of the work**

During this internship, the student will prepare aerogels from cellulose solutions using “green solvents”, NaOH-water and ionic liquids, and make beads of different sizes. The preparation of hybrid organic-inorganic aerogels will also be considered. Various methods of making beads will be used. Fluid rheology will be extensively considered.

The work will involve the use of many techniques, including formulation, rheometry, optical and electron microscopies and aerogel characterisation (density, specific surface area, morphology by high-resolution SEM).

### **Work environment**

The student will work in the Centre de Mise en Forme des Matériaux (Center for Materials Forming or CEMEF), located near Nice (Alpes Maritimes). CEMEF is engaged in the study of the formulation, processing and properties of materials that associates physics, physical chemistry, mechanics, thermodynamics and modelling. CEMEF is dealing with synthetic and natural polymers, and their composites and nanocomposites. CEMEF has strong research activity in the study and development of new biomass-based materials including cellulose dissolution and solutions, composites reinforced with natural fibres, bio-aerogels and bioplastics.

**Keywords:** aerogels, cellulose, beads.

**Skills:** knowledge in polymer (cellulose is a plus) physics and chemistry, fluent in English, capability to work in group, motivation and sense of initiative and capability to report regularly on his/her work.

**Duration:** 6 months, open any time from January 2017 for 6 months

**Salary:** about 1000 €/month.

### **Application:**

The position is for an undergraduate student, at the level of Master degree. Please send your CV, your marks from the last two years and a recommendation letter or email of a reference to:

Tatiana Budtova, Directeur de recherche in Mines ParisTech

tel : +33 (0)4 93 95 74 70; mail : [tatiana.budtova@mines-paristech.fr](mailto:tatiana.budtova@mines-paristech.fr)

Mines ParisTech, Centre de Mise en Forme des Matériaux / Center for Materials Forming (CEMEF)  
Rue Claude Daunesse, CS 10207, 06904 Sophia Antipolis, France  
[www.cemef.mines-paristech.fr](http://www.cemef.mines-paristech.fr)