

## **6 months internship position**

### **3D printing of cellulose**

*Centre for Materials Forming (CEMEF) of Mines Paris, Sophia Antipolis, France*

Recycling paper is essential for both environmental sustainability and resource conservation. It helps to reduce deforestation and saves energy and water for producing new paper and new materials. The 6-months internship position is open in the frame of large national project “Packaging, recycling, recyclability, re-use of papers and cardboards” (Les programmes et équipements prioritaires de recherche (PEPR)). The overall goal of this project is to contribute to a circular economy by turning wastepaper and cardboard into valuable products while minimizing the environmental impact.

The goal of the 6-months internship is to use cellulose pulp of different “quality” to make objects via 3D printing (Direct Ink Writing, DIW). Cellulose will be dissolved and high-performing bioprinter will be used to print objects of various shapes. Cellulose dissolution and rheological properties of solutions will be investigated to select printing conditions resulting in self-standing materials. The objects will be dried in various ways to obtain materials of different porosity. Dry materials will be characterized with density, porosity, specific surface area and morphology. Aerogels will be prepared as one of options of dry materials.

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 and porous materials.

CEMEF has renown expertise in the development of biomass-based materials, in particular, from cellulose via dissolution. CEMEF is world leader in the preparation highly porous nanostructured materials, bio-aerogels, which will be one of the goals of the internship.

Keywords: cellulose, solutions, rheology, gels, aerogels.

Skills: background in polymer chemical physics (basics in polysaccharides is a plus), capability to work in group, fluent in English, motivation and sense of initiative and capability to report regularly on the work performed.

Duration: 6 months

Stipend: about 650 €/month.

The position is available now.

Application:

The position is for a student preparing Master degree.

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

Location : CEMEF/Mines Paris: rue Claude Daunesse, campus Pierre Laffitte, CS 10207, 06904 Sophia Antipolis, France