# Master project from Chair Cellulose Valley

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# « New 3D cellulosic recyclable packaging with high barrier»
# (industrial project)

**Description and expertise of the organization**

The "Cellulose Valley" Chair is a special ecosystem that aims to provide alternatives with new cellulosic materials for packaging applications. It is a consortium of several industrial partners: Marie, Ahlstrom, Decathlon, Chanel, DS Smith, Guillin Emballage, CITEO and Aptar. Each year, 8 students are hired to work on one or more specific problems our partners encounter. Cellulose Valley is located in the LGP2 - Laboratory of process engineering for biorefinery, bio-based materials and functional printing. LGP2 is a joint research unit (UMR 5518) of the French National Center for Scientific Research (CNRS). Its activities range from wood science to packaging converting and printing. The laboratory's distinctive feature is its multi-disciplinary approach to processes, chemistry and materials. What's more, its close links with the paper and packaging industry lead to numerous research projects and specific tools (from laboratory to pilot scale).

**Main tasks**

In recent years, regulatory frameworks and standards adopted worldwide have reinforced and implemented the circular economy and bioeconomy. In this context, cellulose is an excellent candidate for new high-performance bio-based materials. It offers advantages in terms of strength, lightweighting and barrier properties. Companies are increasingly interested in producing them.

The proposal below concerns the development of new cellulosic materials with an innovative character, in collaboration with one of our industrial partners in the field of packaging, or molded cellulose.

The challenges of the Master's project will be to study:

(i) The design of new 3D molded cellulose packaging;

(ii) A new process for providing a barrier;

(iii) Measurement of barrier properties;

(iv) Analysis of the recyclability of the new packaging;

(v) Impact on life-cycle analysis of the proposed solution.

Developing a demonstrator is one of the tasks to be carried out during the internship. Meetings will be scheduled with the industrial research department of the partner concerned,

as well as occasional site visits. The Master's project will last 5 to 7 months at the LGP2 laboratory, beginning in February 2025.

**Candidate requirement**

The candidate must be at engineering school or master's level, with expertise in materials, chemistry or processes. A good level of written and spoken English is required. Work on cellulose or packaging barriers would be a plus. Knowledge of biopolymers and life cycle assessment will be considered. The ability to work in a team, autonomy and motivation are important selection parameters.

**Contact persons involved in the project**


- Dr Candice REY, research engineer,

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Send CV and Motivation letter.

Deadline to apply : 7th october 2024.