

INTERNSHIP OFFER – Master/Projet de fin d'étude

Junior Consultant LCA and Eco-design

Location of the internship:

LGP2 Laboratory – *Laboratory of process engineering for biorefinery, bio-based materials and functional printing - FunPrint ResearchTeam*

461 rue de la Papeterie - Domaine Universitaire - 38 400 St Martin d'Hères

<https://lgp2.grenoble-inp.fr/en>

Aurore Denneulin / Julien Bras

Duration of the internship: 5 to 6 months. Start: February/ April 2027

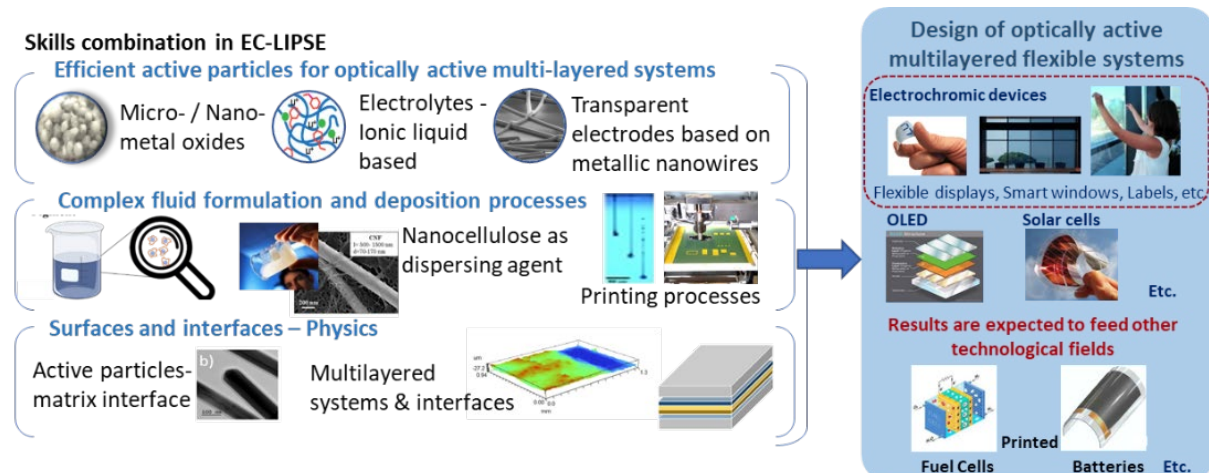
Internship tutors: Lilou Boutarin - Aurore Denneulin – Julien Bras

Background and objectives of the project:

This internship is part of a national collaborative project called EC-LIPSE that aims at the development of Eco-design of optically active multi-layered systems by full-printed approach.

Optically active materials and devices are found in numerous applications related to energy, environment or health, with multiple examples of semiconductors, photovoltaics, catalysts, sensors, etc. Many optical and/or electronic applications still require non-toxic processing media (non-volatile solvents), low-temperature and additive deposition techniques such as coating/printing to meet the needs of large-scale continuous production on flexible substrates. Numerous developments have already been carried out and allowed the emergence of **functional fluids** (inks) to produce thin multi-layered active system (solar cells, OLEDs, sensors, displays, antennas, etc.). Regarding optically active systems, efforts are still needed to develop more eco-designed and easy-process approaches. Indeed, in order to foster an eco-designed and manufacturing strategy towards the production of low energy consumption systems, it is essential to promote the processing of aqueous functional fluids integrating highly-efficient particles, so to propose a full-printing approach of the architecture.

In that purpose, **EC-LIPSE** proposes to address the eco-design and development of innovative sustainable methods for the fabrication of efficient optically active systems, with a first concrete focus on electrochromic devices (ECDs).



Internship objectives:

- You will contribute to develop LCA (or environmental assessment) assignments using SimaPro software.
- You will conduct comparative LCAs of printed and non-printed electrochromic devices, taking into account printing processes issues across the material's life cycle.

This project aims to develop more environmentally friendly electrochromic devices. To this end, non-toxic solvents are prioritized, and bio-based additives are being considered as alternatives to those typically used. The use of printing techniques—an additive manufacturing process—also helps reduce environmental impact.

The objective of this internship is to assess whether the project's strategies genuinely contribute to reducing environmental impact compared to conventional manufacturing processes and the use of toxic materials.

Required skills:

A taste for multidisciplinary projects, as well as motivation will be important selection criteria.

The desired skills for the candidate are:

- ▷ Knowledge of environmental issues related to materials and processes
- ▷ Basic knowledge of Life Cycle Assessment (LCA) and modeling
- ▷ Proficiency in SimaPro software
- ▷ Naturally curious, you enjoy working in a team
- ▷ Autonomy / Rigor
- ▷ Fluency in English
- ▷ An interest in the printed electronics sector is an asset

For any further information and to apply for this offer, please send a CV with a cover letter to lilou.boutarin@grenoble-inp.fr, aurore.denneulin@grenoble-inp.fr