



The goal of this internship is to study the preparation of nanocellulose-based composite materials using different deposition methods (dipping, spray-assisted, GIS, ...) and various surface analysis techniques (ellipsometry, UV-vis spectroscopy, ...) and their optical and mechanical properties. The performance of these materials will be determined by advanced mechanical and optical characterization tools as a function of their composition and structure, the orientation of reinforcing agents, and the experimental conditions. This work will involve the PECMAT and MIM teams at Institut Charles Sadron (Strasbourg, France) and a collaboration with the CERMAV (Grenoble, France) and LCP-A2MC (Metz, France).

- [1] G. Decher *Science* **1997**, *277*, 1232.
- [2] R. Merindol, S. Diabang, O. Felix, T. Roland, C. Gauthier, G. Decher *ACS Nano* **2015**, *9*, 1127.
- [3] R. Merindol *et al.* *ACS Nano* **2020**, *14*, 16525.
- [4] R. Blell, X. Lin, T. Lindström, M. Ankerfors, M. Pauly, O. Felix, G. Decher, *ACS Nano* **2017**, *11*, 84.
- [5] R. Mujica *et al.* *Compos. Sci. Technol.* **2023**, *233*, 109889.
- [6] R. Mujica *et al.* *Adv. Mater.* **2024**, *36*, 2401742.

### **Requirements & Application:**

We are looking for a highly motivated master student having a formation in physical chemistry, chemical engineering or materials science and preferably with skills and/or interests in the following areas: materials, physical chemistry, thin layers, polymers and surfaces.

Please address your application (CV, motivation letter, copy of recent grades) to Olivier Félix ([olivier.felix@ics-cnrs.unistra.fr](mailto:olivier.felix@ics-cnrs.unistra.fr)).