



## 18-MONTHS POSTDOCTORAL POSITION IN MONTPELLIER

### PHYSICO-CHEMICAL BASES OF PROCESSES AND TREATMENTS TO IMPROVE THE LIFE-CYCLE OF LIGNIN-RICH BASED MATERIALS

Common lignocellulosic renewable resources span from wood to bamboo and fast growing species. Their use as materials can be a more effective strategy than burning in the perspective of circular economy, provided their life-cycle and recycling properties are improved. The improvement of lifetime, mechanical strength, resistance towards lignophage attacks or flammability of lignin-rich materials is currently pursued by impregnation treatments, often performed in severe conditions. More advanced treatments, based on the use of mixed solvents with specific interactions with the components of lignocellulosic biomass, are promising alternatives. However, a deeper understanding is needed on the physical-chemistry and sorption mechanisms occurring with complex solvent systems.

A postdoctoral position is open for 18 months in Montpellier and Alès. The aim of the research is to perform test treatments on model lignocellulosic materials in  $\text{cm}^3$  or  $\text{mm}^3$  regime with available and/or original methods. The target of the project, based on the complementary expertise of teams from the chemistry, materials and agrosources communities, is the improvement of the knowledge on deconstruction-reassembly processes in lignocellulosic materials, with expected technological fallouts on wood based materials and organosolv treatments of biomass. Experimental data obtained by complementary characterisation techniques (adsorption volumetry, dynamic mechanical measurements in controlled atmosphere, diffractometry, microscopy and NMR) will allow the development of a model describing the synergic effect of the components of mixed solvents on the swelling and visco-elastic behaviour of wood materials.

Experimental activities will be carried out in the Institut Charles Gerhardt in Montpellier and IMT Mines Alès. The candidate is expected to deal with handling of wood specimens, the characterisation of their behaviour under solvent treatments and the modelisation of the underlying physico-chemical interactions and mechanical response. Useful hints on the field of expertise required can be found in Wood Sci. Tech. doi:10.1007/s00226-018-1022-1, Coll. Surfaces A 532 (2017) 314 and New J. Phys. 18 (2016) 083048.

Eligible candidates should present either a PhD or a first postdoc with accepted papers related to the field of the proposed research topic. Previous international experience or activity in network of laboratories will be especially appreciated. Candidates can contact Francesco Di Renzo ([direnzo@enscm.fr](mailto:direnzo@enscm.fr), +33 607508148) and Nicolas Le Moigne ([nicolas.le-moigne@mines-ales.fr](mailto:nicolas.le-moigne@mines-ales.fr), +33 466785302) and submit their candidature by sending their CV and a motivation letter targeted at this specific call.