**PhD thesis:** Acid coagulation of Natural Rubber Latex: from fundamental mechanism to rubber properties.

Natural rubber latex is extracted from *Hevea* trees, it is a complex colloidal suspension of poly-isoprene particles stabilized by a protein/phospholipidic negatively charged membrane. Upon acidification, particles aggregate, assembling in a percolating network or colloidal gel. This is the first step of a process which gives rise to the production of natural rubber, a material widely uses in the world, with unique and challenging properties yet not clearly understood from a scientific perspective.

This research project is based on the assumption that the mechanism of gelification plays a key role in the control of the rubber matrix properties. As a PhD student, your objectives will be to study the mechanism of coagulation of the latex in connection with the coagulation mode (acid, minerals), to establish the mechanisms of phase transition, collapse and drying of the gels and to correlate them to the mesostructure (macromolecular structure + aggregates) and physical properties of natural rubber. You will use different characterization technics, including light (polarized or not), X-ray and neutron scattering, confocal microscopy, rheology, biochemical analysis.

We are looking for a PhD student with a strong interest in biophysics or soft matter physics, able to integrate in his research approaches including biochemistry and materials engineering. The aim of the project is to contribute both to (i) the development of a new fundamental knowledge and (ii) to improve the quality of rubber supply which contributes significantly to the south-east Asia sustainable development.

This PhD research project will be mainly conducted at UMR IATE, a joint research unit from 4 different institutions (universities and research centers) focused on agropolymers science. We are located in Montpellier, a city in the south of France rich of many universities and their students, in the heart of one of the strongest research community at the interface between agronomy, engineering and fundamental science. Part of the work will also be conducted in Thailand, the worldwide leader of natural latex production, to validate in the field the processes.

**Area of expertise:**

Soft Matter Physics, Engineering, BioPhysics.

**For more information, please contact:**

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**Dead-line for application is June 20, but applicants should contact us rapidly.**

Gross salary will be 1685 € (1375€ after taxes) or 2025 € (1652€ after taxes) if the student apply for specific teaching additional activities.