Postdoctoral Position in Theoretical Biophysics of Plant Growth

Location: Université Paris-Saclay, FRANCE
Duration: 12 months
Start date: Fall 2025
Application deadline: August 1, 2025
Supervisor: Dr. Antoine Fruleux (Chargé de Recherche, CNRS)

Project Overview

We invite applications for a postdoctoral position funded by CNRS to work on the theoretical modeling of plant cell wall growth. The successful candidate will develop and analyze multiscale models that explore the interplay between mechanical stress, turgor pressure, and pectin-mediated cell wall swelling—key mechanisms underlying plant tissue expansion and morphogenesis.

The project integrates approaches from statistical physics, soft matter theory, and stochastic modeling. The recruited researcher will help develop analytical and numerical tools to investigate how biochemical fluctuations and mechanical feedback shape growth dynamics and tissue robustness across different spatial scales.

Qualifications

- PhD in physics, applied mathematics, biophysics, or a closely related field.
- Strong background in theoretical modeling, especially in mechanics, soft matter, or biological physics.
- Experience with numerical simulation (e.g., finite element or finite difference methods).
- Familiarity with stochastic processes or non-equilibrium thermodynamics is a plus.
- Interest in interdisciplinary work at the interface of physics and biology.

Responsibilities

- Develop and analyze physical models (PDE/SPDE-based) of plant cell wall growth.
- Implement numerical simulations of tissue-scale growth using FEM/FDM techniques.
- Contribute to the dissemination of results through publications and presentations.

Work Environment

The postdoctoral researcher will join the LPTMS at Université Paris-Saclay, a leading center for statistical and condensed matter physics. The lab offers a dynamic and collaborative research environment.

Funding & Resources

The position is fully funded (between 3081€ and 4756€ gross monthly salary) for 12 months, including travel support and equipment.

Application Instructions

Send the following materials in a single PDF to antoine.fruleux@cnrs.fr :

- A cover letter outlining your research interests and motivation.
- A full CV including publication list.
- Contact details for two academic references.