

# Stochastic models for the growth of filamentous fungi

Amandine VÉBER

*Université Paris Cité*

`amandine.veber@parisdescartes.fr`

Filamentous fungi form a large family of species playing an important role in the functioning of many ecosystems. They develop in space thanks to the growth and multiplication of filaments (also called hyphae) which allow the absorption and sharing of nutrients and other molecules. In this talk, we shall first present a stochastic growth-fragmentation model for the development of a hyphal network, whose main aim is to identify a small number of key parameters describing the growth of the fungus in homogeneous conditions (in particular, in lab conditions) and to understand and quantify the impact of different forms of stress on this growth. One major limitation of this model is that it does not take the spatial structure of the network into account. In the second part of the talk, we shall discuss how to integrate this spatial dimension into a more complex measure-valued process, whose dynamics depends on its past states.

The results presented are joint work with Vincent Bansaye (Ecole Polytechnique), Lena Kuwata (Univ. Paris Cité) and Milica Tomasevic (CNRS, Ecole Polytechnique) on the maths side, and Cécilia Bobée, Florence Chapeland-Leclerc, Thibault Chassereau, Pascal David, Eric Herbert, Christophe Lalanne, Clara Ledoux, Gwenaél Ruprich-Robert, all at LIED (Univ. Paris Cité) on the biology and physics side.