

# Celebrating Vladas Sidoravicius

Probability Webinar - IM/UFRJ

## Frank den Hollander

Leiden University, The Netherlands

### ***The Parabolic Anderson Model on a Galton-Watson Tree***

We consider the parabolic Anderson model on a supercritical Galton-Watson tree with an i.i.d. random potential whose marginal distribution is close to the double-exponential. Under the assumption that the degree distribution has a sufficiently thin tail, we derive an asymptotic expansion for large times of the total mass of the solution given that initially a unit mass sits at the root. We derive the expansion both under the *quenched law* (i.e., conditional on the realisation of the random tree and the random potential) and under the *half-annealed law* (i.e., conditional on the realisation of the random tree but averaged over the random potential). The two expansions turn out to be different, but both contain a coefficient that is given by a variational formula indicating that the solution concentrates on a subtree with minimal degree according to a computable profile. A key tool in the analysis is the large deviation principle for the empirical distribution of a Markov renewal process.

Joint work with Wolfgang König (Berlin), Renato dos Santos (Belo Horizonte), Daoyi Wang (Leiden).

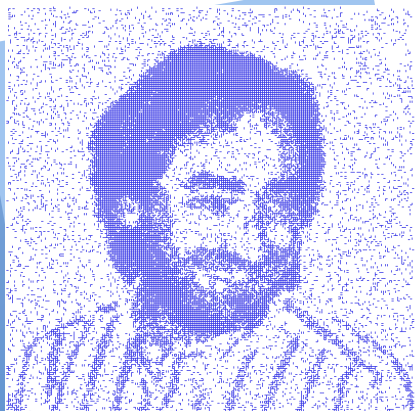
## Donatas Surgailis

Vilnius University, Lithuania

### ***Local Scaling Limits of Lévy Driven Fractional Random Fields***

We obtain a complete description of local anisotropic scaling limits for a class of fractional random fields  $X$  on  $\mathbb{R}^2$  written as stochastic integral with respect to an infinitely divisible random measure. The scaling procedure involves increments of  $X$  over points the distance between which in the horizontal and vertical directions shrinks as  $O(\lambda)$  and  $O(\lambda^\gamma)$  respectively as  $\lambda \downarrow 0$ , for some  $\gamma > 0$ . We consider two types of increments of  $X$ : usual increment and rectangular increment, leading to the respective concepts of  $\gamma$ -tangent and  $\gamma$ -rectangent random fields. We prove that for above  $X$  both types of local scaling limits exist for any  $\gamma > 0$  and undergo a transition, being independent of  $\gamma > \gamma_0$  and  $\gamma < \gamma_0$ , for some  $\gamma_0 > 0$ ; moreover, the 'unbalanced' scaling limits ( $\gamma \neq \gamma_0$ ) are  $(H_1, H_2)$ -multi self-similar with one of  $H_i, i = 1, 2$ , equal to 0 or 1. The paper extends Pilipauskaitė and Surgailis (2017) and Surgailis (2020) on large-scale anisotropic scaling of random fields on  $\mathbb{Z}^2$  and Benassi et al. (2004) on 1-tangent limits of isotropic fractional Lévy random fields.

Joint work with Vytautė Pilipauskaitė (University of Luxembourg).



**August 23, 2021**

14:00 (Rio de Janeiro local time, CEST-5)

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