Abstract
In this talk, we shall consider the model called "branching random walk" (arising in statistical physics) from the perspective of extreme value theory. We shall first discuss the point process convergence for this model with i.i.d. regularly varying displacements and obtain, as a consequence, the scaling limit of maxima, order statistics and gap statistics solving a problem posed by Gregory Schehr during a conference in Bedlewo in 2014.

We also consider an extension of the above model with (possibly) dependent displacements and calculate the limiting point process. This answers questions asked by Antar Bandyopadhyay and Jean Bertoin in independent personal communications with the speaker and verifies two related conjectures by Brunet and Derrida (2011). Generalisation to the multi-type case will also be discussed and a significant improvement of the main result of Durrett (1983) will be presented. The main tool of the computation of the weak limit is a superposition central limit theorem for regularly varying point processes. This central limit theorem is one of the key results of speaker's PhD thesis and it connects two apparently unrelated seminal works of Hult and Lindskog (2006) and Davydov, Molchanov and Zuyev (2008) in a canonical fashion.

We shall also talk about a large sample test to detect the presence of long range dependence for a stationary stable random field observed over a grid. This test is the first statistical test based on the group action corresponding to stationary stable random field.

This talk is based on speaker's PhD thesis and will be given prior to its submission.

All are cordially invited