A classification of loss landscapes for the difficulty of weak recovery by gradient-type algorithms

I will report on recent work with Gerard Ben Arous and Reza Gheissari on the performance of stochastic gradient descent and gradient descent during the initial phase of the minimization of high dimensional loss functions, and try to understand how they manage to escape the region of maximal entropy. As illustration, we will show how with analytics and numerics, how these methods apply to a broad range of generalized linear models. If there is time further examples, such as phase retrieval and two-component gaussian mixture models will be discussed.