

Branching processes in random matrix theory and analytic number theory

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The limiting distributions for maxima of independent random variables have been classified during the first half of last century. This classification does not extend to strong interactions, in particular to the flurry of processes with natural logarithmic (or multiscale) correlations. These include branching random walks or the 2d Gaussian free field. More recently, Fyodorov, Hiary and Keating (2012) exhibited new examples of log-correlated phenomena in number theory and random matrix theory. As a result (and as a testing ground of their observations) they have formulated very precise conjectures about maxima of the characteristic polynomial of random matrices, and the maximum of L-functions on typical interval the critical line. I will describe the recent progress towards these conjectures in both the random and deterministic setting.

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