

Brownian Surfaces

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I will review the topic of random maps and its connection to classical objects of probability theory, namely random walks and peeling processes, and branching processes arising in slice decompositions and layer decompositions.

The first lecture will focus on the “local” model of Boltzmann maps and will comment on its relation to “non-local” models of maps, and will introduce peeling processes and some applications.

The second and third lectures will focus on slice decompositions, which is, from the geometric point of view, a convenient way to understand the Bouttier-di Francesco-Guitter bijection between maps and trees. We will show how this decomposition can be used to show convergence of random maps to Brownian surfaces in various topologies.

Time permitting, I will comment on the use by Curien-Le Gall of layer decompositions to show robustness of these results when modifying locally the distances, and how it is used by Carrance to show convergence of Eulerian triangulations to the Brownian map.