Random simplicial tessellations: geometry of the typical cell

A tessellation in $\mathbb{R}^d$ is a countable locally-finite collection of convex polytopes, which cover the space and have disjoint interiors. Random tessellations are among the most central objects studied in stochastic geometry. Their analysis is motivated by their rich inner-mathematical structures, but in equal measure also by the wide range of applications in which they arise. However, there are only very few mathematically tractable models for which rigorous results are available and which do not require an analysis purely by computer simulations.
In this talk we consider four models of this kind, which lead to random simplicial tessellations. The first model is a classical Poisson-Delaunay tessellation, whose construction is based on the homogeneous Poisson point process. The other three models, called β-, β'- and Gaussian-Delaunay tessellations, has been introduced recently and their construction is based on a space-time paraboloid hull process and generalizes that of the classical Poisson-Delaunay tessellation. We will study the probabilistic properties of the typical cell of these random tessellation. Intuitively, typical cell of a random tessellation $\mathcal{T}$ is a polytope chosen "uniformly at random" from $\mathcal{T}$. Apart from this we will consider the connections between the models.