Bridge Decomposition of Restriction Measures

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In the early 60s Kesten showed that self-avoiding walk in the upper half plane has a decomposition into an i.i.d. sequence of "irreducible bridges". Loosely defined, a bridge is a self-avoiding path that achieves its minimum and maximum heights at the start and end of the path (respectively), and it is irreducible if it contains no smaller bridges. Considering only the 2-dimensional case, one can ask if the (likely) scaling limit of self-avoiding walk, the SLE(8/3) process, also has such a decomposition. I will talk about recent work with Hugo Duminil from Ecole Normale Superieure that provides a positive answer, using only the restriction property of SLE(8/3). In the end we are able to decompose the SLE(8/3) path as a Poisson Point Process on the space of irreducible bridges, in a way that is similar to Ito's excursion decomposition of a Brownian motion according to its zeros. Our decomposition can actually be generalized beyond SLE(8/3) and applied to an entire family of "restriction measures", hence the title of the talk. If time permits I will also talk about the natural time parameterization for SLE(8/3), which has immediate applications towards the bridge decomposition.