

Heat flow on snowballs

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Abstract

Quasisymmetric maps are fruitful generalizations of conformal maps. Quasisymmetric uniformization problem seeks for extensions of uniformization theorem beyond the classical context of Riemann surfaces.

The goal of this talk is to show that quasisymmetric uniformization problem is closely related to random walks and diffusions. I will explain how the existence of quasisymmetric maps is equivalent to heat kernel estimates for the simple random walk on a family of planar graphs. The same methods also apply to diffusions on a class of fractals homeomorphic to the 2-sphere.

These ideas will be illustrated using snowballs and their graph approximations. Snowballs are high dimensional analogues of Koch snowflake.