

Minimisers of the Allen-Cahn equation on hyperbolic graphs

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The Allen-Cahn equation is a second order semilinear elliptic PDE that arises in mathematical models describing phase transitions between two constant states. The variational structure of this equation allows us to study energy-minimal phase transitions, which correspond to uniformly bounded non-constant globally minimal solutions. The set of such solutions depends heavily on the geometry of the underlying space. In this talk we shall focus on the case where the underlying space is a Gromov-hyperbolic graph. In this case there exists a minimal solution with any 'nice enough' asymptotic behaviour prescribed by the two constant states. The set in the graph where the phase transition for such a solution takes place corresponds to a solution of an asymptotic Plateau problem.