Friendly frogs and stable matchings

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Consider the following two-player game. A set K of points in R^d is fixed – we can imagine (for the two-dimensional case) that these are locations of lilypads on a pond. There are two frogs and two players take turns to move a frog to an unocupied lilypad in such a way that the distance between the frogs is strictly decreased. A player that cannot move loses. (The distance must decrease since the frogs are friendly and do not like to be moved further apart, but the frogs cannot occupy the same point since the lilypads are small and cannot support more than one frog.) We analyze this game and some variants of it, discovering links to a range of models of stable matchings. We focus on cases where K is a random infinite set (for example a Poisson process).

This is joint work with Alexander Holroyd and James Martin.