Nonlocal heat flows and a partition problem for eigenvalues

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Abstract: In this talk, we shall describe a nonlocal heat flow. Its infinite time asympototics are eigenfunctions. We then apply this idea to a class of singularly perturbed parabolic systems, and to prove that the singular limits solve a gradient flow problem for a partition problem for the Dirichlet eigenvalues. Moreover, the free interfaces are smooth in evolution away from a relatively closed subset of higher codimensions.