Flowing to minimal surfaces

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We discuss a new geometric flow, the Teichmüller harmonic map flow, that is designed to deform closed parametrised surfaces towards critical points of the Area, i.e. towards minimal surfaces.

The flow is simply defined as L^2-gradient flow of the Dirichlet energy, considered as functional of both a map and a metric on the domain, but exploits the symmetries of this functional. As such, it enjoys the strong regularity properties known from harmonic map flow for as long as the injectivity radius of the domain is bounded away from zero, while trying to make the map not only harmonic but also conformal and thus minimal.

In this talk we will define the flow and explain some of its key properties, showing in particular that global solutions of the flow, guaranteed to exist for non-positively curved targets, change (or decompose) an arbritrary initial surface into (a union of) branched minimal immersions, possibly parametrized over surfaces of lower genus.