

**Algebraic and geometric classification of  
Yang-Mills-Higgs flow lines**

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The Yang-Mills-Higgs flow on a compact Riemann surface is modelled on a nonlinear heat equation, and therefore existence of the reverse flow is problematic in general. In this talk I will explain how the existence of a certain filtration (analogous to the Harder-Narasimhan filtration, but with the opposite inequality on the slopes) means that one can gauge the initial condition so that the reverse flow exists for all time. This leads to an algebraic classification of flow lines between pairs of critical points. A refinement of these ideas leads to a geometric classification of flow lines in terms of certain secant varieties, which can then be used to distinguish between broken and unbroken flow lines.