The AdS instability conjecture provides an example of weak turbulence appearing in the
dynamics of the Einstein equations in the presence of a negative cosmological constant.
According to this conjecture, there exist arbitrarily small perturbations to the initial data
of Anti-de Sitter spacetime which, under evolution by the vacuum Einstein equations with
reflecting boundary conditions at conformal infinity, lead to the formation of black holes
after sufficiently long time.

In this talk, I will present a rigorous proof of the AdS instability conjecture in the setting
of the spherically symmetric Einstein-scalar field system. The construction of the unstable
initial data will require carefully designing a family of initial configurations of localized
matter beams and estimating the exchange of energy taking place between interacting
beams over long periods of time, as well as estimating the decoherence rate of those beams.
I will also discuss possible paths for extending these ideas to the vacuum case.